NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 4, NUMBER 9 MARCH 2, 1987

▶ LAN LINKS

Mini vendors woo NETBIOS

Backing grows as users await arrival of LU 6.2.

BY PAULA MUSICH
Senior Editor

A growing number of minicomputer vendors are looking to IBM's Network Basic I/O System as a way to more effectively interconnect their systems with personal computer networks, but the usefulness of the communications interface may be cut short by the arrival of IBM's LU 6.2.

NETBIOS compatibility on minicomputers will better enable these vendors to integrate networked personal computers into their larger systems without forcing personal computers to emulate dumb terminals, according to industry analyst Andria Rossi, president of Rossi Consultants in Marblehead, Mass.

Rossi said she believes most minicomputer vendors, including Data General Corp. and Datapoint Corp., are working on NETBIOS compatibility.

Tandem Computers, Inc. already sup-

See **NETBIOS** page 34

▶ PRICING PRACTICES

PBX makers sell low to nab market share

Low growth, fierce competition shapes strategy.

Cutthroat private branch exchange pricing lays foundation for upgrades and add-on profits

			Percent change
PBX-only sales	1986	$3.74b	
	1987	3.56b	(4.8%)
	1988	3.11b	(12.6%)
			Percent change
Add-on sales	1986	$412m	
	1987	558m	+35.5%
	1988	770m	+38.0%

PBX add-on equipment includes voice-messaging systems, automatic call distributors, call detail recording systems and other ancillary gear.

SOURCE: NORTHERN BUSINESS INFORMATION, INC., NEW YORK

BY BOB WALLACE
Senior Editor

FRAMINGHAM, Mass. — Major private branch exchange vendors are selling switches at or near cost as part of a strategy to increase market share and to profit from future upgrades and sales of add-on equipment, *Network World* has learned.

While most PBX vendors do not admit to practicing cutthroat pricing, industry insiders say it has become an increasingly important competitive weapon in the battle for market turf.

Buying market share in this slow-growth industry ensures vendors a continuing revenue stream from maintenance contracts, upgrades and sales of ancillary PBX products, such as voice messaging and call detail reporting systems.

PBX market researchers predict that sales

See **Add-on** page 8

FEATURE FOCUS

FTS spells Full-Time Service for the federal pact winner

BY VICTOR J. ANDRADE AND BRIAN NESMITH
Special to Network World

Uncle Sam, in the guise of the General Services Administration, is shopping for a phone company, and telecommunications vendors are vying for his attention. He's got a mile-long shopping list and at least $4.5 billion to spend.

The GSA is responsible for telephone service to federal agencies through the Federal Telecommunications System (FTS), the largest private switched communications network in the world. The FTS supports intercity services, primarily voice and low-speed data, to more

☞ See **FTS** page 29

▶ ONE-STOP SHOPPING

Hospital discovers network cost cure

Voice/data net a strategic boost.

BY BOB HAMEL
Senior Editor

MODESTO, Calif. — One-stop shopping with Pacific Telesis Group (PACTEL) saved Memorial Hospital Association more than a half million dollars in wiring and equipment for its integrated network, which has given the hospital a new competitive edge.

The Memorial Digital Information Network (MEMDIN) provides voice and data services to 1,300 users at the main hospital here and at two others in nearby Ceres, Calif. MEMDIN has helped Memorial Hospital Association cut communications expenditures and offer innovative services that have allowed it to dominate key segments of the local health-care market.

The PACTEL-supplied network includes a Northern Telecom, Inc. SL-1 private branch exchange, which handles voice and data traffic for all three sites. Through the switch, users have access to two Data General Corp. Eclipse MV/10000 and three DG S/280 minicomputers housed in the data center here. The Ceres sites are linked to the SL-1 through Northern Telecom's SL-1/Remote Processing Equipment switch modules and CoitCom Communications, Inc. microwave facilities.

Two and a half years ago, Kamruddin Shams, currently vice-president of information services, came to the Memorial Hospital Association as director of information systems. He wasn't impressed with what he saw. "We had an

See **Hospital** page 36

NETWORK LINE

News

AT&T urges its shareholders to approve a 25% increase in the number of common shares, an action portending acquisitions that will flesh out the firm's data networking strategy. Page 2.

▽

US Sprint hopes to speed the delivery of enhanced services to users by building a subnetwork supporting the fledgling SS7 signaling standard. Page 2.

▽

Apple is slated to unveil two "open" Macintosh models, a highspeed Ethernet card and its own version of Unix. Page 4.

▽

Features

Today's networking technology directs attention toward ISDN and virtual private nets, but an old standby, analog private-line services, are still getting the job done nicely. Page 31.

NEWSPAPER

▶ STOCK OPTIONS

AT&T seeks new shares to gain spending money

Proxy proposal augurs acquisitions.

BY PAM POWERS
Senior Editor

NEW YORK — AT&T proposed a 25% increase in the number of its common shares last week, a move analysts said is in preparation for acquisitions to help the company flesh out its data networking strategy. The proposal came as new doubts were raised about AT&T's financial health. Moody's Investors Service, Inc. last week lowered its rating of AT&T's preferred shares and debt, saying it expects AT&T to be forced into another write-down.

In a proxy statement to shareholders, AT&T urged approval of the increase in the number of its outstanding common shares. The proposal, which will be voted on at the company's April 15 stockholders meeting, would raise more capital for the long-distance giant. Companies often issue stock in order to raise money for acquisitions or to fend off a takeover by increasing the value of the company.

In fact, AT&T raised the specter of takeover in the proxy statement, saying that an increase in outstanding common shares "would make more difficult, or costly, and less likely, a takeover of the company." But analysts agreed the the possibility of takeover is very remote.

"Who but the U.S. government could afford to buy AT&T at a cost of roughly $30 billion?" quipped Glenn Pafumi, first vice-president of research with New York-based Dean Witter Reynolds, Inc. A more likely use for the capital raised would be the acquisition of companies that would enhance AT&T's presence in the data networking market.

"This action would give AT&T the ability to finance large acquisitions. I suspect that's one of their intentions," said Charles Nichols, a first vice-president with E.F. Hutton & Co. Inc. in New York. Nichols said he thinks acquisitions could be a big part of AT&T's still-nebulous data networking plans. "Data networking consists of so many different components. I think AT&T will finally conclude it doesn't have to make everything at home," Nichols said.

Bruce Kin Huie, a senior analyst with Framingham, Mass.-based In-

See **AT&T** page 38

▶ CENTRAL OFFICE

Nynex buys $400m worth of Northern switch gear

BY PAM POWERS
Senior Editor

NASHVILLE — Northern Telecom, Inc. said last week it will supply Nynex Corp. with $400 million worth of digital central office switching equipment that will enable the regional Bell holding company to offer more sophisticated services. Northern Telecom also projected substantial growth in revenue and earnings throughout fiscal 1987.

The Nynex contract comes on the heels of an agreement Northern Telecom recently signed with Southwestern Bell Corp. to supply $100 million worth of DMS-100s and Traffic Operator Position Systems (TOPS).

Terms of the Nynex agreement call for Northern Telecom to supply Nynex Material Enterprises Co. with DMS-100 digital switching systems, and TOPS Meridian Business Services software over a three-year period. Meridian Business Services is a software package that gives the central office the means to offer integrated voice and data services to end users.

New England Telephone and New York Telephone Co. will use the DMS-100s to replace existing electromechanical analog switches. According to a New England Telephone spokesman, 66% of the Bell operating company's customer access lines are served by digital switches today, and the remaining electromechanical switches will be upgraded to digital by 1992.

Joe Gustafson, director of new product development with New York Telephone, said that the heavy equal-access schedule imposed by the Modified Final Judgment and heightened demand for enhanced business data services is driving the BOC's switch purchases.

Both New England and New York Telephone are also using AT&T's 5ESS switches in their network upgrades.

Gustafson said the digital switches will enable the company to offer enhanced services such as customer control and digital Centrex on a wider basis.

"Digital switches give the customer control of a network on a real-time basis," Gustafson said. "In the past, a customer would have to submit a request to us for automatic route selection, and then wait a week or more while we issued a service order. Now the cus-

See **NTI** page 34

AT&T sales chief retires

NEW YORK — Richard Holbrook, AT&T's top sales executive, was expected to retire yesterday, reportedly to be succeeded by John Smart, current vice-president of manufacturing for AT&T's telephone equipment operations.

Holbrook, a 30-year veteran of AT&T, was named senior vice-president of business sales during the company's reorganization of equipment and long-distance sales forces last year. Smart has spent much of his tenure with AT&T in sales and marketing of long-distance communications services.

Table of contents

TOP NEWS

Sen. Ernest Hollings fulminates against regulators for doing nothing about the $2b telecommunications trade deficit. **Page 6.**

A little-known international 800 firm, apparently eager for exposure, accuses AT&T of fraudulent advertising. **Page 8.**

INDUSTRY UPDATE

Micom overhauls its marketing strategy, expanding its product line to meet changing user needs. **Page 9.**

TELECOM TRENDS

AT&T is the victor in its court suit against Eaton, and the spoils are $324,000 in termination charges. **Page 11.**

DATA DELIVERY

Codex claims the honor of bringing out the first combined modem-multiplexer product, the Dual Multipoint Data Modem. **Page 13.**

LOCAL NETWORKING

George Mason University's campus buildings are linked by a broadband local network that is a data and video superhighway. **Page 15.**

COMMUNICATIONS MANAGER

For Candy Rodgers of Del Monte, communications management is her life; in her spare time, it's her hobby. **Page 17.**

NEW PRODUCTS AND SERVICES

Siemens Data Switching hopes to woo users with its Advanced Network Processor 1220 for private networking. **Page 21.**

FEATURES **Page 28.**
CALENDAR **Page 38.**

▶ SIGNALING PROTOCOLS

US Sprint building CCS7

BY BOB WALLACE
Senior Editor

FRAMINGHAM, Mass. — US Sprint Communications Co. has begun construction of a signaling subnetwork similar to AT&T's that is designed to pave the way for enhanced services and increased network efficiency.

Both AT&T and US Sprint claimed their subnetworks, each of which will support the CCITT-approved Common Channel Signaling System 7 (CCS7), will be completed before year end. MCI Communications Corp., which also plans to support the advanced signaling protocol, would say only that it plans to begin implementing the technology this year and continue the project in 1988.

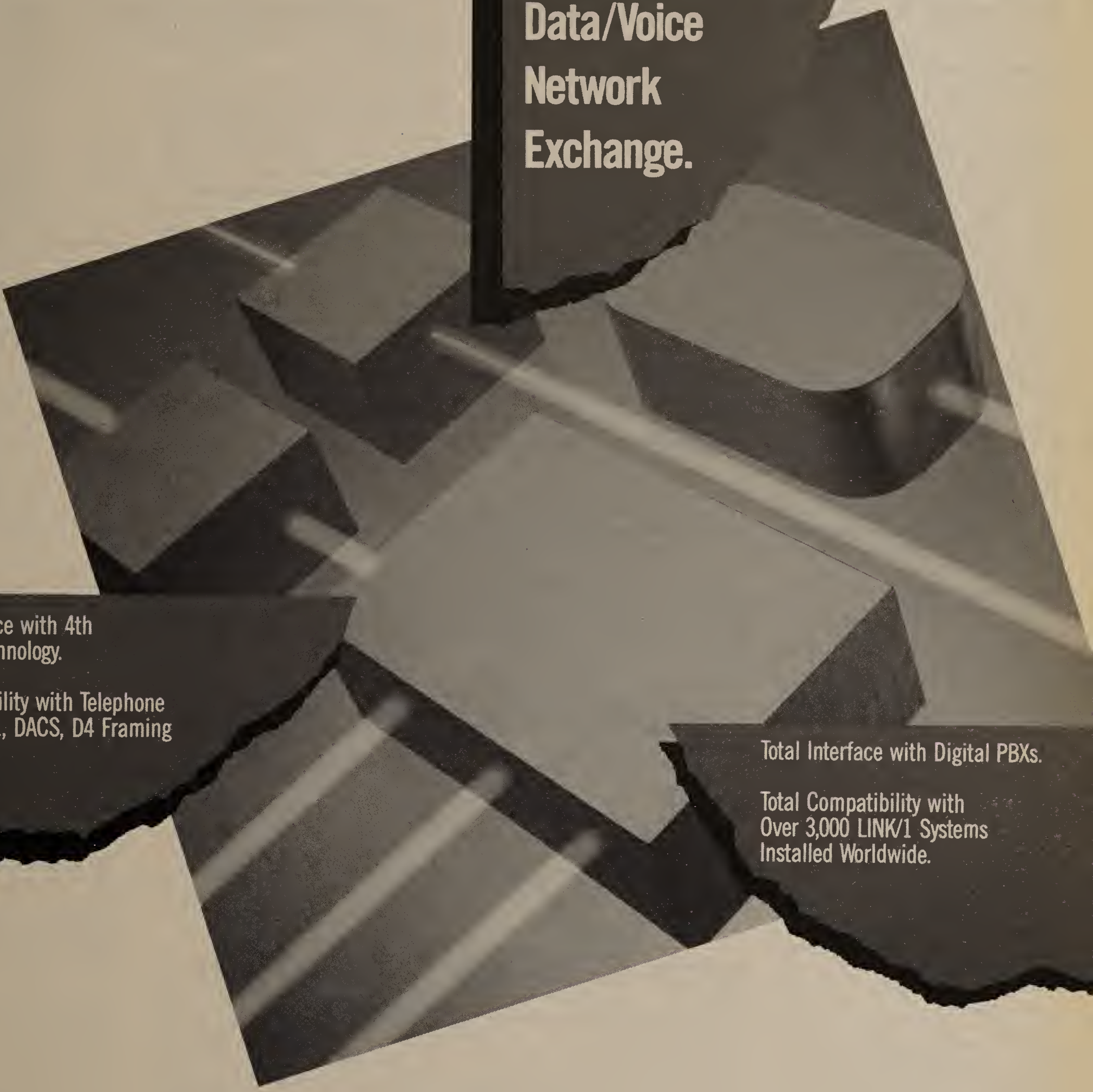
Use of CCS7 will pay big dividends for AT&T, US Sprint and MCI by increasing the efficiency of their backbone networks. With common channel signaling, calls are set up using a signaling subnetwork that ensures the traffic bearing network can handle the call before the transmission and switching facilities are seized. This frees these long-haul highways for voice and data traffic.

While implementation of CCS7 represents a major step forward for all three carriers in terms of efficient network use and enhanced services, for AT&T the new scheme is simply an enhancement of a current signaling system.

US Sprint and MCI currently use inband signaling systems. With this signaling method, calls are set up as they pass through the network. A coast-to-coast call could thus tie up transmission and switching facilities as the call is set up, only to be blocked near its termination point because of local traffic congestion.

Dick Cassam, vice-president of network development for US Sprint, maintained the company would realize both monetary and capacity advantages from using CCS7 in its long-distance network.

See **Sprint** page 5



Introducing LINK/2. The Total Data/Voice Network Exchange.

Total Intelligence with 4th Generation Technology.

Total Compatibility with Telephone Protocols—DS-1, DACS, D4 Framing and Format.

Total Interface with Digital PBXs.

Total Compatibility with Over 3,000 LINK/1 Systems Installed Worldwide.

Timeplex®

Timeplex, Inc. Woodcliff Lake, NJ 07675 201-930-4600

LINK/1 is a registered trademark and LINK/2 a trademark of Timeplex, Inc.

▶ NETWORK MANAGEMENT

Standards work spurred

MAP/TOP specifications now in review.

BY JOSH GONZE
Staff Writer

The release of Manufacturing Automation Protocol Version 3.0 in mid-April is expected to provide a standard for centralized management of factory networks, an advance that could hasten development of mainstream network management standards.

Specifications for the factory standard were recently submitted to a technical review committee for inclusion in MAP 3.0 by the MAP/TOP Network Management Subcommittee. The specifications are an extension of standards work already completed by the International Standards Organization (ISO) and the Institute of Electrical and Electronics Engineers.

MAP's progress reflects intensified efforts by several communications standards organizations to craft protocols for centralized network management.

Much of the toil directed at creation of net management standards is centered on the ISO, according to Alan Grossman, chairman of the Network Management Subcommittee at the Corporation for Open Systems (COS). With network management standards, Grossman said, "the ISO is trying to do in about three years what it took them eight years to do with File Transfer and Access Method."

ISO has gone so far as to define five functional areas for Open Systems Interconnect (OSI) net management: fault management, configuration management, performance management, accounting management and security management. Its model is planned as an addendum to the OSI Reference Model.

Much of the ISO's work on such standards is still preliminary. Grossman said that the ISO model for network management is only sketchy, and that it "doesn't really give enough detail for people to go ahead and do the ensuing work."

Representatives from several other groups in the standards arena, including the MAP/TOP Users Group, the IEEE and the National Bureau of Standards, joined for a panel discussion on net management at the Phoenix Conference on Computers and Communications last Thursday. Several vendors, including AT&T and Concord Communications, Inc., participated.

See **Standards** page 36

▶ MACNETWORKING

Apple debuts two "open" Macintoshes

BY MARY PETROSKY
West Coast Correspondent

LOS ANGELES — At the AppleWorld conference here, Apple Computer, Inc. is expected today to bolster the networking capabilities of its Macintosh personal computer with the unveiling of its long-awaited "open" Macintosh, which allows for installation of add-on boards such as network interface cards.

Apple will introduce two models of the open Macintosh, the Macintosh SE and Macintosh II. Both models will be able to support operating systems such as Unix and MS-DOS, in addition to the native Macintosh operating system. That support would simplify file sharing between different types of microcomputers.

At the conference, AST Research, Inc. is expected to announce board-level products that will allow the Macintosh SE and Macintosh II to run MS-DOS applications. And, in a briefing on the new products last week, Apple announced it would be supporting Unix System V Release 2 with Berkeley Unix 4.2 extensions on the high-end Macintosh II. Apple will also offer its own version of Unix, called A/UX.

Providing an open architecture for the Macintosh means the machine's "ability to be configured for various networking environments is enhanced," said Charlie Oppenheimer, product manager for the Macintosh SE. Apple's support for MS-DOS and Unix is based on strong user demand, several Apple executives noted.

To date, the Macintosh has been a closed machine. Although Apple provided built-in connections to its AppleTalk network, connections to other network types, such as Ethernet, were handled primarily through an external device or through a peripheral port. Now, the machines based on new Macintosh architecture will be able to accept network interface cards for Ethernet, the IBM Token-Ring and other types of networks, said John Sculley, Apple's chairman and chief executive officer.

Apple has been working with 3Com Corp. to jointly develop an Ethernet interface for the Macintosh II, according to Chris Bryant, Apple's marketing manager for networks. This product, called EtherTalk, will be available in the second quarter of this year at a price under $1,000, Bryant said.

The interface card will initially support the Transmission Control Protocol/Internet Protocol, with support of AppleTalk protocols to follow. The decision to provide TCP/IP first was based on Apple's belief that initial sales of the Macintosh II will be to users in higher education and other market segments that rely on Unix. "The first Ethernet availability will be in

See **Apple** page 8

▶ MS-DOS

New DOS to take over

BY MARY PETROSKY
West Coast Correspondent

SEATTLE — In a recent briefing for the press and market analysts, Microsoft Corp. provided a broad picture of the future of MS-DOS, a future that includes two versions of the now ubiquitous operating system for IBM Personal Computers and compatibles.

Microsoft believes that New DOS, as it has dubbed the new version of its operating system, will be very attractive as a network server operating system. Microsoft Chairman Bill Gates said, in the short term he expects the use of New DOS on network servers to grow more quickly than its use on stand-alone personal computers.

"If you're buying a server today, I'd think real hard about buying a server that can run the New DOS," Gates said.

Microsoft said it is working on New DOS because it cannot support all needed enhancements in upcoming releases of the current MS-DOS. "Evolution is great," Gates said, "but it won't get us all the way there."

Gates acknowledged that there needs to be a clear way for networked personal computers running MS-DOS to address a server running New DOS. However, Microsoft would not elaborate on this scenario or explain how existing network applications might need to be modified to function on the server while also being able to support network nodes running MS-DOS.

New DOS is being designed to take advantage of expanded memory and other features of the Intel Corp. 80286 and 80386 microprocessors that are not currently tapped by MS-DOS. New DOS will be multitasking, allowing several applications to execute simultaneously, and will be able to access 16M bytes of memory.

An important new capability in New DOS is its support of interprocess communications. Interprocess

See **New DOS** page 38

NETWORK WORLD

Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
617/879-0700

Editor
Bruce Hoard
Managing Editor
John Gallant
Features Editor
Steve Moore
Assistant Managing Editor — News
John Dix
Assistant Managing Editor — Production
Lisa Guisbond
Senior Editors
Bob Hamel
Paul Korzeniowski
Paula Musich
Pamela T. Powers
Bob Wallace
Staff Writers
Michael Fahey
Josh Gonze
New Products Editor
Jim Brown
Washington, D.C. Correspondent
Karyl Scott
1273 National Press Building
529 14th Street NW
Washington, D.C. 20045
West Coast Correspondent
Mary Petrosky
3350 West Bayshore Road
Suite 201
Palo Alto, CA 94303
Assistant Features Editors
Christine Casatelli
Robert Mitchell
Associate Editor
Beth Lazarus
Copy Editors
Peter Hoffmann
Joanne McQuaid
Anne Ryder
Art Director
Dianne Barrett
Informational Graphics Designer
Alan Hopkins
Assistant to the Editor
Cheryl Tynan

Publisher
F. Douglas DeCarlo
Administrative Manager
Mary Fanning

Board Chairman
Patrick J. McGovern

Chief Executive Officer CWCI, Inc.
Axel Leblois

President/CWCI, Inc.
Tom Casalegno

President CWCI-Framingham
Lee Vidmer

Senior VP-Communication Services
Jack Edmonston

Second-class postage paid at Framingham, MA, and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue the last two weeks in December by CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-800-544-3712, within Pennsylvania 1-215-630-9500.

Non-qualified subscribers: $3.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

Four weeks notice is required for change of address. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

Network World is distributed free of charge in the U.S. and Canada only to qualified management or professionals who specify and maintain communications equipment and systems, including voice, data and video, as well as to common carriers, consultants, systems houses and manufacturers of communications equipment.

PHOTOCOPY RIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

POSTMASTER: Send Change of Address to *Network World*, Box 1021, Southeastern, Pa. 19398-9979.

Copyright 1987 by CW Communications/Inc. All rights reserved. Reproduction of material appearing in Network World *is forbidden without written permission.*

ABC

Special requests for reprints and permissions only should be addressed to Nancy M. Shannon, CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

▶ PRODUCT DEVELOPMENT

3Com boosting twisted-pair wire LAN speeds

10M bit/sec on nonshielded wire cited.

BY PAULA MUSICH
Senior Editor

SANTA CLARA, Calif. — 3Com Corp. said last week it is developing products for shipment this summer that will enable its Ethernet personal computer networks to operate over nonshielded twisted-pair telephone wire at 10M bit/sec.

3Com refused to release specific information about the internal development effort, but said it is intended to enable its installed base of 300,000 network adapters to adopt the wire option. According to Wes Raffel, director of marketing for 3Com's hardware products division, the products will include an add-on hardware component for the existing adapters.

Raffel also hinted at the potential wire distances 3Com will be able to achieve driving twisted pair at 10M bit/sec. "When AT&T announced Starlan, it stated that 95% of all desktops are within 100 meters of punchdown blocks or wiring closets. That's an area that we're interested in. We'd like to be able to have the 80% to 90% solution." Raffel said the product will be able to span 80 meters.

In using existing telephone wiring, 3Com will likely substitute Ethernet's linear bus topology for a star-shaped network linking desktops to wiring closets. This would require 3Com to develop a hub device that would likely include electronics to boost and condition signals from node to node.

Permissible wire distance is dictated by the speed of the signal carried; the higher the data rate, the shorter the maximum wire run.

Nonshielded twisted-pair wire, for example, is more vulnerable to outside electrical interference than coaxial cable and is limited in its ability to span great distances. The fastest data rate supported in existing local networking products over this type of wire is 4M bit/sec.

"We had enough questions from our customers about this that we thought it would be prudent to announce publicly that we have the technology, and it won't take a guru to install it," Raffel said.

Installation difficulties and costs have been a problem for 3Com, according to Paul Andres, marketing director at MOD-TAP System, a Harvard, Mass.-based firm that provides and installs its own nonshielded twisted-pair wiring scheme for networks from different vendors.

"I think they see the handwriting on the wall," said Robert Galin, past chair of the IEEE's 802.3 Starlan task force. "Structured building wiring, especially in buildings that already have spare wiring in place — that is the way the world will go."

In using this wiring, 3Com had to find a way to allow both voice and data wires to coexist in the same jacket without interfering with each other. Raffel said that the current required to ring telephones creates 105-volt electrical spikes that can normally disrupt local network operation.

The technical breakthrough, he said, was discovering a way to prevent packet loss when a 10M bit/sec Ethernet twisted-pair net was in the same cable jacket as a station wire driving a remote telephone bell.

▶ WATS SERVICES

MCI's Prism Plus hits Pro America

Service offers lower rates than its high-volume AT&T rival.

BY MICHAEL FAHEY
Staff Writer

WASHINGTON, D.C. — MCI Communications Corp. last week unveiled Prism Plus, a virtual-banded long-distance rate option designed to compete against AT&T's Pro America line of services.

Prism Plus, which was scheduled to go into effect yesterday, pending Federal Communications Commission approval, is targeted at customers with $500 or more in monthly long-distance bills, according to an MCI spokesman. The service carries a $75 monthly fee and a monthly usage charge. The option offers a 10% discount for monthly long-distance usage in excess of $2,500.

Separate access line not needed

Unlike some WATS offerings, the virtual-banded Prism Plus service does not require a separate access line, and service is not restricted to specified geographic areas or bands.

"Once you get above 125 hours of service per month, Prism Plus is a very attractive service, and it gets cheaper as your amount of usage increases," said long-distance pricing expert Robert Self, president of Market Dynamics, a consulting company based in New York.

"With this option, you don't need special lines that tie up ports on your switch, and you don't have to worry about least-cost routing."

According to Self, an average New York-based user would spend $11,009 for 1,000 hours of long-distance service using Prism Plus.

The same calls would cost $12,273 using Pro America III, AT&T's cheapest comparable service at the $1,000 per month calling level, Self said.

MCI also proposed an average 3.5% rate reduction, scheduled to take effect yesterday, for its MCI WATS service.

Rate update

VIENNA, Va. — Cable & Wireless Management Services, Inc. reduced its rates for T-1 and 56K bit/sec digital transmission services last week for users who subscribe before March 31. The company, formerly called TDX Systems, operates an all-digital network linking 50 cities in the U.S.

Under the terms of the promotion, 56K bit/sec circuits will be offered at 20% below current monthly rates. Customers signing one-year agreements will receive a 25% rate reduction and a 33% discount on circuit installation. Rates for T-1 service will be discounted 15% to 25% below Cable & Wireless' rates for 18 designated U.S. cities.

NEW YORK — New York Telephone Co. agreed last week to reduce its rates by $500 million over the next four years. The company said the rate cut is due to expected tax savings under the new federal tax laws and reductions in the company's costs for employee pension and death benefits. Residential and business rates will drop by $100 million in August and will be cut by an additional $400 million in January 1990.

WASHINGTON, D.C. — The National Association of Regulatory Utility Commissioners recommended last week that a scheduled increase in telephone subscriber line charges be delayed until later this year. The group, made up of state utility regulators, recommended that a study be conducted after June to evaluate the impact of the current $2 charge and any future increases. The Federal Communications Commission, which sets the line charges, favors increasing the charge to $3 in June and $4 in July 1988.

Sprint from **page 2**

"CCS7 will allow our network to handle greater amounts of traffic without tying up valuable switching and transmission facilities," he stated. "Offering enhanced service in the future would tie up an enormous amount of facilities if we were not using CCS7." Cassam would not quantify expected savings as the result of using CCS7.

Jack Dane, switching and signaling system development manager for US Sprint, said that Honolulu, Burlingame, Calif., and Woodworth, Ill., were linked in the company's first CCS7 field trial in October 1986. The project used prototype equipment to support such functions as service authorization code look-ups, he noted.

Users will not fully realize the benefits of CCS7 until the Bell operating companies extend out-of-band signaling capability to the user. Barring bypass access to the carrier's network entry point, CCS7 will initially be used exclusively between the long-distance carriers' points of presence.

US Sprint will complete field-testing of a core network that uses CCS7 in May. The core network uses Digital Switch Corp. gear for the signal transfer points used to control the signaling subnetwork, and Tandem Computers, Inc. processors for Database Control Points (DCP).

AT&T asserted that installation of its CCS7 signal transfer points is almost complete. The carrier is in the process of connecting subnet components with 56K bit/sec transmission facilities. AT&T claimed enhancement of its 4ESS central office switches to support CCS7 is well under way.

One of the primary differences between CCS7 and AT&T's current signal control method is that CCS7 is closer to international standards, according to Gerry Mayfield, president of professional services for the DMW Group, a Stamford Conn.-based communications consulting and research firm.

"CCS7 is also faster and offers additional technical enhancements," Mayfield said. He said CCS7 uses message-oriented signaling, while CCS employs a bit-oriented signaling protocol.

Bit-oriented signaling only determines if the user telephone is ringing on hook or off hook. Use of message-oriented signaling enables the calling party's number to be raised on the telephone set display of the party being called.

In the US Sprint scheme, the signaling subnetwork currently comprises: signaling points that format incoming information and act as a front end to each network switch; central office switches, typically Northern Telecom, Inc. DMS 250s; signaling points that route messages to other signaling points; and data base control points, the data bases used with enhanced services.

In the AT&T CCS7 network, the subnet comprises: AT&T 4ESS central office switches; 14 AT&T 3B20 superminicomputer signal transfer points; and equipment serving as repositories of information on services authorized for each user.

▶ YANKEE GROUP SEMINAR

IBM lacks easy links

9370, S/36, S/38 get unflattering marks.

BY PAUL KORZENIOWSKI
Senior Editor

NEW YORK — IBM's flagging financial health is due in part to Big Blue's inability to offer easy-to-use links between departmental systems and larger systems, according to speakers at a seminar sponsored here last week by The Yankee Group, a Boston-based market research firm.

Session leaders at the conference, "IBM: Mastering the Transition," said that IBM's financial woes are deep-rooted, cannot be cured by a single strategic product such as the 9370 departmental system, and will continue for at least the next two years.

Howard Anderson, managing director of the Yankee Group, predicted that IBM would realize only a 2% increase in sales for 1987. The company's traditional increase of 10% or more will not be possible until 1989, and these increases may not return at all if IBM fails to meet challenges in departmental computing, communications and other core areas, Anderson said.

The computer giant was caught off guard by developments in these fields because it had mistakenly assumed its chief competition would come from AT&T and Japanese computer manufacturers, Anderson said. Instead, Digital Equipment Corp. emerged as IBM's most formidable competitor when customers began to develop applications on departmental systems rather than on IBM mainframes. IBM has been unable to cash in on the departmental market because of compatibility problems with its systems, speakers said.

"Connecting a System/36 or System/38 to an IBM mainframe is a cumbersome task and will remain that way until 1988, when IBM starts delivering more comprehensive communications links," said Tom Henkel, a senior analyst at The Yankee Group.

An IBM spokesman denied Henkel's claim, saying System/36 or System/38 customers can easily access mainframe data though IBM's Distributed Data Management.

Last fall, IBM launched a direct attack on DEC and the departmental computing market with the announcement of the 9370 system.

The processor family is based on the company's mainframe architecture, and it runs mainframe application software, a capability that the System/36 and System/38 lack. But despite that limitation, the 9370 has been hailed by analysts as a Holy Grail, the sought-after item that could bring the company profitability and slow DEC's sales momentum.

It remains to be seen, however, if the 9370 can emerge as a dominant departmental system, even among IBM customers. One potential 9370 customer interviewed at the seminar said privately, "The 9370 does not have sufficient horsepower to support the number of terminals we need for our departmental workers."

Other potential 9370 customers at the conference questioned the ease of use of the mid-range processor. A number of users said departmental systems should be run by end users, and they claimed the 9370 requires at least one and possibly two MIS workers. An IBM spokesperson said the 9370 is equipped with a number of packaged offerings so it can be maintained by non-MIS personnel.

"Many of the current 9370 shortcomings stem from marketing rather than technical considerations," claimed The Yankee Group's Henkel. IBM does not want to cannibalize 4381 sales, and the company deliberately stripped down the 9370 in order to avoid that, he said. Henkel predicted IBM will announce a 9370 replacement for the 4381 in 18 to 24 months. He also expects IBM to try to make the 9370 more user-friendly.

Besides the processor communications headaches IBM is contending with, the company has been trying to manage its other forays into the communications market

See **IBM** page 7

▶ RATES OF RETURN

Regulated firms pay $4.5b in yearly fees

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Regulated telecommunications companies are paying a whopping $4.5 billion each year just to comply with rate-of-return regulations imposed by federal and state regulators, according to a study currently being compiled by the National Telecommunications and Information Administration (NTIA).

The inordinately high cost of rate-of-return compliance to telephone companies, governments and, ultimately, users is causing many state and federal officials to consider more efficient and economic alternatives, the study said. Those costs include spending on attorney fees, research and analysis and preparation of documents.

The findings of the NTIA's study on rate-of-return regulations are expected to be released later this year and will likely coincide with the Federal Communications Commission's inquiry into possible changes in federal regulations.

"[Rate-of-return] regulation has evolved from a simple means of policing corporations to a complicated process of income redistribution and cartel management," said Kenneth Robinson, NTIA policy adviser. "NTIA has a charter to analyze and advocate new approaches that foster efficiency, productivity and competitiveness."

Rate-of-return rules have been used by the government for more than 100 years to regulate the prices charged by such businesses as telephone companies. The increasing complexity of the telecommunications industry and rapid changes have made the rules costly to administer, and taxpayers and telecommunications users ultimately shoulder these costs.

The current rules are believed to create economic and technological disincentives on the part of the regulated service providers.

Since regulated firms are allowed to recover all service-related costs from ratepayers, firms do not have much incentive to limit operating costs, according to critics.

The rules also encourage regulated firms to keep rates down, causing the companies to shy away from technological innovation.

Some of the alternatives under consideration are the "social contract" approach in which regulated companies would be required to freeze rates for residential and small business users for a set period of time. Subsequent rate increases would be limited by a formula or index, such as the consumer price index.

The "market basket" approach would give regulated companies broad freedom in their day-to-day operations but would set general earnings guidelines. The firm's annual earnings would be measured against those of a comparable group of firms, or a market basket, and excessive profits would be refunded to consumers.

Another alternative is to give regulated telephone companies discretion to raise rates within a predetermined range, or band, of prices without the need for regulatory approval.

▶ TELECOM TRADE DEFICIT

Hollings raps regulators

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Federal regulators got a tongue-lashing from Sen. Ernest Hollings (D-S.C.) last week for not taking action to help reverse the massive $2 billion U.S. telecommunications trade deficit.

Hollings lambasted officials from the Departments of State and Commerce and the office of the U.S. Trade Representative, saying, "The rhetoric of these officials amounts to nothing more than bureaucratic double-talk, because American firms continue to go out of business when faced with foreign competition.

"There's nothing wrong with trade reciprocity. You all act like you're supposed to make friends with foreign trade officials and do nothing to protect America's industrial backbone," he added. Hollings is a member of the Communications Subcommittee and chairman of the parent Commerce Committee.

The targets of Hollings' wrath included Alan Wood, deputy U.S. trade representative; Ambassador Diana Lady Dougan, of the Bureau of Communications and Information at the Department of State; and Alfred Sikes, assistant secretary for communications and information for the Department of Commerce.

Sen. Daniel Inouye (D-Hawaii), chairman of the Communications Subcommitee, said last week's hearing was the first in a series of periodic meetings that will be held to assess the actions taken by federal regulators on telecommunications issues. Congress has oversight authority over the Federal Communications Commission, the Commerce and State Departments and the National Telecommunications and Information Administration.

Hollings praised the efforts of FCC Chairman Mark Fowler, who also testified, for entering the telecommunications trade debate. "Chairman Fowler, I'm glad you decided to get into this trade issue," Hollings said. "You are the telecommunications trade expert, and this shows you have more initiative than the other folks sitting at your table."

Fowler outlined for the members of the newly reorganized Communications Subcommittee the FCC's plans to create an international telecommunications trade model with which to judge foreign firms wishing to enter the U.S. market.

If the home markets of foreign firms are closed to U.S. firms, the FCC would, under Fowler's plan, move to block those firms from doing business in the U.S. The FCC is now formulating rules that would allow them to do this.

Sen. John McCain (R-Ariz.) indicated that the subcommittee will be writing telecommunications trade legislation later in this session of Congress aimed at "leveling the playing field" of international telecommunications trade.

▶ MOUNTAIN BELL

Telenet, BOC collocate

BY JIM BROWN
New Products Editor

PHOENIX — Telenet Communications Corp. said last week it will move its packet-switching facilities here into a Mountain Bell central telephone switching office as a cost-cutting measure.

The equipment relocation, to be performed this month, is expected to reduce Telenet's costs of accessing Mountain Bell's local lines by eliminating charges for passing calls between the two firm's switching facilities.

Those savings will be somewhat offset by the space rental fee Telenet, headquartered in Reston, Va., will pay the Bell operating company, a figure that Telenet would not disclose.

Analysts feel, however, that Telenet will reap other benefits from the move, including the ability to remain cost-competitive with Mountain Bell's own local-area data transport service, which is expected to gain Federal Communications Commission tariff approval this month.

Mountain Bell will use its own equipment to offer packet service in Phoenix, Denver and Salt Lake City local access and transport areas.

As with other BOCs, Mountain Bell has to use packet carriers such as Telenet to carry traffic between LATAs. The BOC is also required to provide customers equal access to other third-party packet-switching vendors.

"By collocating our switch, we're trying to make sure Mountain Bell doesn't favor its own enhanced service over Telenet, Tymnet or other outside service providers," said Michael Hirsch, Telenet's director of business development for network services. "We look at collocation as an indication on Mountain Bell's part that the company is clearly going to treat us equally."

Analysts said that, in general, rates approved for packet services provided by other BOCs, including New York Telephone Co. and Chesapeake and Potomac Telephone Co. of Washington, D.C., have been lower than those of Telenet and other value-added network providers.

John McQuillan, of Cambridge, Mass.-based McQuillan Consulting, said the collocation move will allow Telenet to discover whether the BOCs' price advantage is primarily due to location of packet switches at the central office. "I think Telenet is going to shed a little light on what the fair cost for a local packet service should be," he said.

But equipment collocation raises other issues. Ben Occhiogrosso, an analyst with New York-based DVI Communications, Inc., said collocation could make it easier and less costly to access the data transmission facilities of BOC-provided integrated voice and data services.

BOCs that offer packet services may want to establish relationships with packet carriers to make it easier and less expensive for their customers to send packets to other LATAs. Analysts say Mountain Bell packet service customers may find Telenet more attractive because of the switch location.

"The collocation raises a nasty issue," said Kathryn Korostoff, a market analyst with the Framingham, Mass.-based International Data Corp. "Can a Bell operating company create a situation where their users are going to be more inclined to use one value-added network over another?" ◘

IBM from **page 6**

successfully.

"IBM made a $600 million investment in MCI Communications Corp. that is now worth only about $300 million," Anderson said.

The IBM spokesman characterized the company's dealings with MCI as a strategic, long-term partnership, not a short-term investment.

In addition, the purchase of Rolm Corp. has not been as fruitful as was hoped, Yankee Group speakers contended. They said that to date IBM has been unsuccessful in meshing its product offerings with those of Rolm.

When questioned about Yankee's assessment of the Rolm/IBM relationship, George E. Harvey, Rolm vice-president of marketing, said the two companies have been working closely to integrate the companies' product lines.

According to Harvey, approximately 10% of the Rolm private branch exchange lines sold last year are used for data communications. Recent enhancements to Rolm's CBX line were designed to supply the product with the bandwidth needed to support data communications and to help the company increase the percentage of data lines sold. ◘

INSTALINK460 DOV Mux lets you add terminals wherever you have telephones.

Our success is based on giving you the same old line.

Take advantage of your building's current phone lines to expand data traffic. INSTALINK460 data-over-voice local muxes let you plug into the future without installing anything.

Add terminals wherever you have single or multiple line phones. Just plug the terminal into your phone jack, your jack into INSTALINK, and the INSTALINK Controller into your main telephone switch.

Any other way to add terminals to your existing data network should be avoided at all costs. Because they all cost plenty. Now, MICOM's INSTALINK460 data-over-voice local mux lets you add an async terminal absolutely anywhere you currently have a telephone. And it's as simple as plugging your phone into an ordinary outlet.

The beauty is that you can go right on using your phones. Data service won't interfere with tone dialing or voice-grade modems. And voice service isn't affected by an interruption of data service.

So what happens if your company reorganizes or if a department equipped with INSTALINK moves? You simply unplug your INSTALINK network, carry it to where you want it, and plug it back in.

INSTALINK460 transmits at speeds up to 19.2 Kbps for distances as great as 22,000 feet per channel. And when you're ready to build a widely dispersed campus network, it interfaces with INSTATRUNK480, our high capacity local T1 mux.

Call our applications hotline. We have all the answers you need on INSTALINK. Or to any other thorny datacomm problem that's bugging you.

INSTALINK460. A datacomm product you'll only be interested in if your company has telephones.

Cable can turn into an ugly snake that will bite you in the future. INSTALINK helps you avoid the horrors of costly, inflexible pre-wiring.

MICOM Systems, Inc., 4100 Los Angeles Avenue, Simi Valley, CA. 93063-3397 Europe: UK-(44) (635) 832441. Int'l: USA-(01)(805) 583-8600.

"MICOM," "INSTATRUNK480" and "INSTALINK460"*

1-800-MICOM-US

DATACOMM BY MICOM

More ways to help computers do more.

▶ LITIGATION

AT&T accused of fraud

Court case may be attempt at notoriety.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Worldwide 800 Services, Inc., a little-known firm that offers international 800 service, last week filed suit against AT&T, claiming the long-distance giant fraudulently advertises its international 800 offering.

At a press conference here, company officials said they filed complaints against AT&T with the Federal Communications Commission and the U.S. District Court in Illinois last week to prevent AT&T from using advertising that "misleads the public."

Worldwide 800 claims that AT&T's advertisements lead the public to believe AT&T is the only provider of international 800 service. The AT&T print advertisement at issue reads, "You won't find this type of service anywhere else." Worldwide 800's Chief Executive Officer Stanley Scheinman said his firm has been offering international toll-free service for 12 years in Europe and Asia. As a result, he said, AT&T's claim is false. Unlike AT&T, Worldwide 800 is not marketing its service in the U.S., although the officials said the company plans to do so shortly.

Most industry analysts said they were not familiar with Worldwide 800 and claimed the company's legal efforts were an attempt to win free publicity and perhaps even a financial settlement from AT&T.

A Mailgram announcing the conference underscored Worldwide 800's eagerness for exposure. It stated, "Photo, videotape and general media coverage are welcome" and that "excellent interview and visual opportunities" would exist.

AT&T spokeswoman Edith Herman said AT&T had no comment on Worldwide 800's action, but added that AT&T's advertising is neither deceptive nor fraudulent.

Worldwide 800 acquired last year

Worldwide 800 was acquired last year by the three-year-old Hitk Corp., a management consulting firm in Stamford, Conn. The company was formerly owned by a group of private European investors and was incorporated in the Netherlands under the name Service 800 N.V., Scheinman said. Worldwide 800 is now headquartered in Stamford, with sales offices in Switzerland and the Netherlands.

Worldwide 800 said its client list includes Dean Witter Financial Services, Inc., Drexel Burnham Lambert, Kidder, Peabody & Co., Inc., Merrill Lynch & Co., Inc., The Sheraton Corp., American Airlines, Inc., British Airways and a number of other international firms.

However, Merrill Lynch claims it has no such relationship with Worldwide. Three telecommunications managers at Merrill Lynch involved in international and voice communications contacted by *Network World* said their firm does not use Worldwide 800's services and that they knew little about the company.

"It's one of those things where you recognize the name of the company, but you don't know whether the services they offer are a reality or not," said a Merrill Lynch telecommunications manager who asked not to be identified.

Apple from **page 4**

conjunction with Unix," explained Bryant.

Kinetics, Inc. of Lafayette, Calif., will be supplying an Ethernet connection for the Macintosh SE, according to Steven Nelson, Kinetics marketing manager. Kinetics' EtherPort SE is due to ship in June, at a price of $850. The interface card will come with software that supports both AppleTalk protocols and TCP/IP. Kinetics plans to support other protocols as well, Nelson said.

Apple's Oppenheimer said he is aware of several third-party developers investigating the possibility of building Token-Ring connections for the Macintosh II, but he does not expect a similar board-level product for the Macintosh SE.

In addition, Apple will offer a product for sharing data between Macintosh and MS-DOS environments. It will include an external 5¼-inch floppy disk drive, a special connector card for attaching to the drive and a software utility called Interfile that provides file transfer and some file transformation capabilities. Apple will likely offer a limited set of file transformations.

The Macintosh SE is based on a Motorola, Inc. 68000 microprocessor and has room for one add-on card, which must be installed by a computer dealer. "It's not really a very open Mac," said Norm DeWitt, director of the personal computer industry service for Dataquest, Inc., a San Jose, Calif.-based market research firm. "I don't think one slot gives you a lot of expansion capability," DeWitt said. He added that any add-on board for the Macintonsh SE will be unique to that machine because of its proprietary bus. The most significant aspect of the new Apple computers is that they round out Apple's line, DeWitt said.

The Macintosh II is based on the Motorola 68020 microprocessor, uses the Texas Instruments, Inc. NuBus bus and features six expansion slots to accommodate add-on boards. Macintosh II boards can be installed by the user. Both computers also have built-in connections to Apple's AppleTalk network.

▶ INSULT & INJURY

Ztel gets the boot

BY BOB HAMEL
Senior Editor

WILMINGTON, Mass. — As if things were not bad enough for troubled private branch exchange maker Ztel, Inc., the company was forced recently to vacate its office facilities here.

According to a source within Ztel who requested anonymity, the company had not paid rent on its offices for the past several months. An attorney with Hale & Dorr, Ztel's legal counsel, said a suit for eviction and damages had been filed by Vazza Associates, the firm that owns and manages the Ballardvale St. building. The attorney indicated that, to remain at the 181 Ballardvale St. site, the company would have had to post a bond, an action it was hesitant to take.

When asked if the company was forcibly evicted from the premises, the attorney stated, "they left in the context of eviction proceedings."

The Ztel source said the company is seeking office space in Worcester county, in the Harvard, Mass., area.

The attorney said Ztel is expected to "notify all creditors with a concrete strategy for payment" within a week of occupying new offices.

Vazza Associates would not comment on the matter.

Add-on from **page 1**

of such add-ons will soar in the next five years, even as the dollar value of PBX sales drops (see chart on page 1). Some insiders claim users may spend as much as six times the sales price of a PBX on upgrades and add-on equipment over the life of the product.

"Vendors are trying to establish market share at all costs," according to John Unger, executive vice-president of the San Francisco-based Comsul Ltd., a communications consulting firm. "They hope to increase their base of users by selling PBXs below cost. Once they have this user base, they work on selling additional PBX equipment to these users."

Once in the door, the vendor considers the user secured. Ian Angus, president of Angus TeleManagement Group, a Toronto-based PBX consulting concern, said that few users swap vendors when they need larger or different types of switches.

Also, most customers buy add-on equipment from the same vendor that sold them the PBX. The PBX vendor is less likely to be dragged into a bidding war when selling ancillary hardware and software to a captured user than during the original battle to win the contract, Angus explained. "Few vendors are making any money on new PBX installations," he said. "Most PBX vendors use the strategy of making their money on add-ons, station moves and changes, and upgrades."

Mark Axelowitz, Northern Telecom, Inc.'s top add-on direct salesman in New York, claimed add-on sales present a much greener pasture than PBX sales. "For every dollar in new sales, there are six more dollars to be made in add-on sales," he said.

Axelowitz claimed several vendors have already adopted the pricing practice. "Many vendors are selling PBXs below price. This is partly because we have many distributors selling our product. In New York for example, I may be selling a new system against three other distributors, which is crazy," he said.

"Locally," he continued, "either the Northern Telecom distributor or the direct salesperson is cutting prices to win the business. We will do that because the add-on business is so profitable. There is no doubt the add-on market is where the most profits are to be made." Axelowitz sold $1.5 million worth of PBX add-ons in the first eight months of 1986. He listed voice messaging systems and call-detail recording gear as the two hottest add-ons.

Other PBX add-on equipment includes automatic call distribution systems and data switching accoutrements. A user's need to move or change roughly 30% of the company's telephone sets each year also represents a lucrative source of service revenue.

Kim Myhre, vice-president of communications research at International Data Corp., a research and consulting company based here, claimed 95% of PBX lines installed last year were for PBXs that replaced smaller switches or key telephone systems.

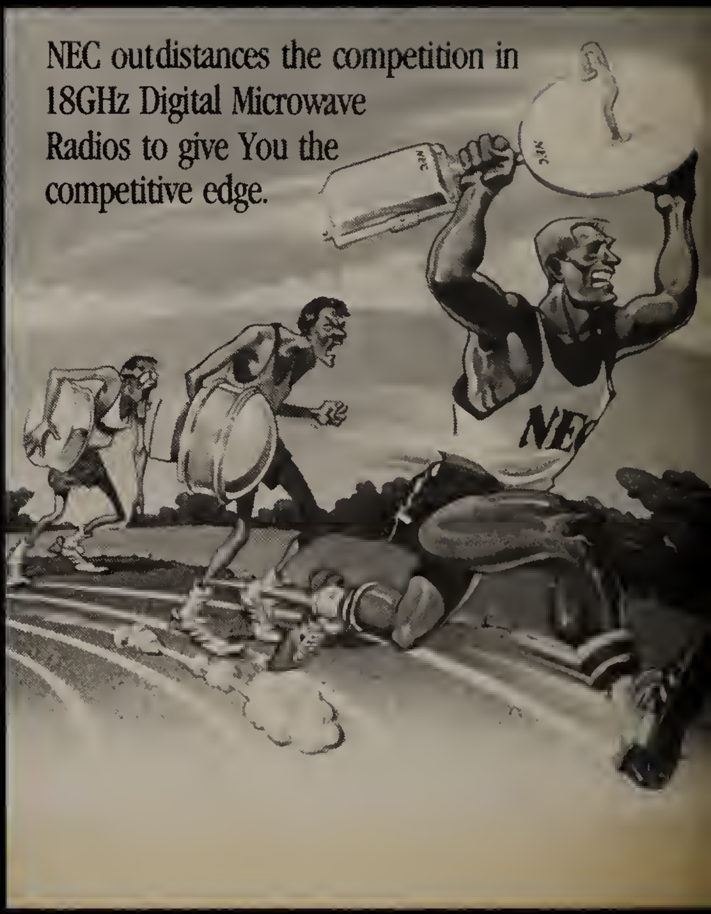
"In trying to win some of this PBX replacement business, price is something the vendors can give up to get the PBX in the door," he said. "PBX makers look forward to revenues from add-on equipment and service sales."

AT&T spokeswoman Ruthlynn Newell would not comment on whether AT&T has sold PBXs below price. She did say AT&T had become a much tougher competitor in PBX pricing. "AT&T has a history of not being considered a strong competitor on price. But we have become extremely price-competitive over the last year and a half."

Newell cited AT&T's Special Bid program, targeted at large users, which provides substantial discounts for volume equipment purchases. The program is administered on a case-by-case basis and does not have any discount tiers, she explained.

Rolm Corp. was not available for comment on the issue.

Go the extra mile
with the leader of the pack.
Find out how at the end of
this card.


NEC outdistances the competition in 18GHz Digital Microwave Radios to give You the competitive edge.
NEC
NEC
NE

INDUSTRY UPDATE

> “Up until recently, I was one of those hapless Americans who thought an RBOC was some type of upscale tennis shoe.
>
> **Jody Powell**
> Moderator of an Ericsson Information Systems, Inc.
> presentation at the USTA conference
> Indianapolis

Market shares of network management system vendors*

Codex Corp.	23.5%
Paradyne Corp.	21.5
Racal-Milgo, Inc.	15
AT&T	10.7
General DataComm Industries, Inc.	9.8
Infinet, Inc.	7.1
Data Switch Corp.	5.8
Other	6.6
	100% ($38.40m)

* Based on year-end 1985 domestic shipments of modem-based net management systems.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

▶ MARKETING STRATEGY

Micom alters line to keep customers

BY PAM POWERS
Senior Editor

SIMI VALLEY, Calif. — The winds of change are howling through Micom Systems, Inc. as the company reacts to changing user needs by repositioning its product line and altering its channels of distribution.

Since 1973, when it entered the data communications arena, Micom has maintained an impressive growth rate to become a $190 million company in fiscal year 1986. But in the middle of 1985, revenue took a sudden downturn. Disappointing year-end results spurred intensive soul-searching on the part of Micom's top strategists. The outcome is a major overhaul of the firm's marketing strategy, which has been under way for the past six months.

According to Chris Kenber, Micom's vice-president of marketing, Micom initially gained its fame with a low-end statistical multiplexer product in 1976. That was followed three years later by a data private branch exchange product. The company continued to expand its low-end product offerings in the 1980s with such components as protocol converters and limited-distance modems. This low-end strategy reaped considerable benefits, positioning Micom as a leader in component sales.

But 1985 ushered in an industrywide slowdown that resulted in flat sales of Micom's major product lines. At the same time,

See **Micom** page 10

▶ SOFTWARE

IBM boosts prices

BY PAUL KORZENIOWSKI
Senior Editor

RYE BROOK, N.Y. — In a move to increase its revenue and establish a base for future revenue growth, IBM recently announced price hikes for its Information Network Services and for 240 software programs.

Monthly maintenance prices for 240 of its software programs, most of which run on IBM 370 series machines, were raised by an average of 10%. The price hikes went across the board for application programs and networking packages such as IBM's Network Problem Determination Application.

Prices for services for the Information Network were raised by an average of 6%. For example, the cost of transmitting 1,000 characters on the network rose from 3.3 to 3.4 cents.

Analysts said IBM was launching a two-pronged attack. In the short term, the company is trying to stem a recent decline in profit growth by increasing its revenue. Over the last few years, IBM has tried to cut operating costs with programs such as early retirement.

In the long term, IBM is trying to shift its revenue base away from hardware, the company's bedrock, to software, a scenario that analysts have predicted. IBM understands that the growth rate for large system hardware has been slowing and wants to shift into the high growth area of software.

INDUSTRY EYE
PAM POWERS

Profit-seekers shortsighted?

Many domestic telecommunications firms are grappling with declining profits by cutting expenses, but some of those hasty cost-cutting maneuvers could sound the death knell for those companies.

AT&T, IBM and MCI Communications Corp. have all implemented drastic cost-cutting measures in the aftermath of poor earnings performances in 1986. Numerous other companies have followed suit. While doing so, most have said they will spare areas vital to the success of their businesses.

Typically, divisions slated to remain untouched by cost cuts include sales and support, marketing, and research and development. However, in view of the size of the slices made in annual expenses, it's difficult to believe that those key areas will escape unscathed.

Research and development generally accounts for 7% to 12% of a communications firm's annual budget — a little cost cutting could go a long way there. Furthermore, the payoff from research and development is not immediate, which might make it a target area for the company official whose concerns are firmly rooted in the present profit picture.

Eliminating sales and support staff, however, could be tantamount to corporate suicide. Customers are lost quickly and in large numbers when a vendor attempts to cut corners in those areas. Staff with more future-oriented functions might appear, in the immediacy of a financial crisis, to be more disposable. But what happens if they are eliminated?

Technological innovation and marketing savvy may be sacrificed to the god of profit. The staff of the marketing and research and development departments, if their strength is sapped by numerous layoffs, will fail to produce successful strategies and attractive products. That could foster consumer reliance on foreign operations, whose marketing and research and development operations have been, and most likely will be, kept fully staffed.

Sources inside AT&T have told *Network World* that recent layoffs have decimated the ranks of talented staff in the company, enough to cause serious concern. In the short term, the shareholder may profit handsomely from current cost-cutting measures. But the consumer, and the company, may fare poorly in the long term.

BRIEFS

Excelan, Inc. signed OEM agreements with **Valid Logic Systems, Inc.** and **Altos Computer Systems, Inc.** for Excelan's Ethernet Transmission Control Protocol/Internet Protocol networking products.

$

Scientific-Atlanta, Inc., a Fortune 500 company, and **Advanced Communications Engineering, Inc. (ADCOM),** are jointly pursuing the private network market for satellite-based, two-way interactive data and secure video communications. Scientific-Atlanta will provide marketing and technical support, while ADCOM will expand ongoing business in private two-way very small aperture terminal networks.

$

Case Communications, Inc. signed agreements with **US West Information Systems** and **US West Corporate Communications.** Under one of the the agreements, US West Information Systems will distribute the full line of Case data communications products to businesses within its 14-state core territory, and US West Information Systems will purchase a minimum of $2 million worth of Case products during the next 18 months.

In a separate agreement, **US West Corporate Communications** purchased more than $1 million worth of Case equipment for internal use by US West, Inc. subsidiaries.

See **Briefs** page 10

Micom from **page 9**

it became apparent that the company's installed base of customers was developing new communications needs that the company was not positioned to meet.

"Micom saw slackening demand at the low end," explained Kim Myhre, vice-president of communications and distributed processing at Framingham, Mass.-based International Data Corp.

"They have traditionally relied heavily on distributors, so they weren't sure who their customers were or what they wanted. They knew they had to move to the high end to keep their existing customer base, but they had a hard time doing it."

Kenber said his company was dealt a heavy blow when Digital Equipment Corp. commenced aggressive marketing of its Ethernet local-area network. "DEC got deadly serious with its pricing and positioning. They then started to move a very big chunk of our customer base toward Ethernet," he said.

While DEC wooed customers away, other problems developed for Micom. The proliferation of personal computers created a need for complete networking, but Micom was firmly entrenched in the individual box approach to data communications.

Micom first responded to the Ethernet threat by acquiring Westford, Mass.-based Interlan, Inc. in mid-1985. But, Kenber said, "there were two efforts remaining to make us a provider of an integrated solution." Those were developing a new product focus and new channels of distribution.

The new product focus involves the creation of a network management umbrella under which Micom will offer a wide range of wide-area and local-area networking solutions. One particular project calls for enhancing its data PBX to serve as a gateway to other local nets. Kenber stressed that the key to success will be finding a balance between sales of low-end products, which are Micom's bread and butter, and high-end products, to which most of its customer base is now migrating.

The other process, expanding and altering distribution channels, is one Kenber admits will be tricky. "I'm trying to figure out how to reposition our existing channels, our direct sales force and our entire internal structure to satisfy the higher end requirements of our existing customer base," he said. "In a sense, it's easier to work solely with a direct sales force, but we have some extremely profitable delivery channels that I don't want to give up," he added.

Consequently, the company will maintain its profitable Black Box catalog sales channel and continue to sell most low-end products through distributors. Distributor sales currently account for about 35% of total annual sales.

In addition, Micom will establish relationships with value-added resellers that can provide users with sophisticated network design and support functions. "The value-added reseller is the ideal channel for the unsophisticated user who needs help implementing integrated solutions," Kenber said.

Micom has not yet emerged from stormy financial seas. According to Ray Thomas, chief financial officer, fiscal year 1987, now in its final quarter, has shown growth but "not as much as one would like." To ameliorate continued slow sales in some areas, the company will impose cost control measures this year. Thomas said that in 1986, about 6% of the work force was dismissed, but he added he expects no further companywide reductions.

Kenber hastily dispelled doubts about Micom's success. "We have always been exceedingly profitable and a cash generator. To this day, we haven't lost money." ◼

Briefs from **page 9**

Contel Corp.'s Federal Systems sector combined its Spacecom division and Government Systems division to create two new operating divisions: Applied Systems and Technical Systems.

Applied Systems division will focus on Contel Federal Systems' turnkey contracts for design and implementation, while the Technical Services division will manage Contel Federal Systems' engineering, maintenance and operations services.

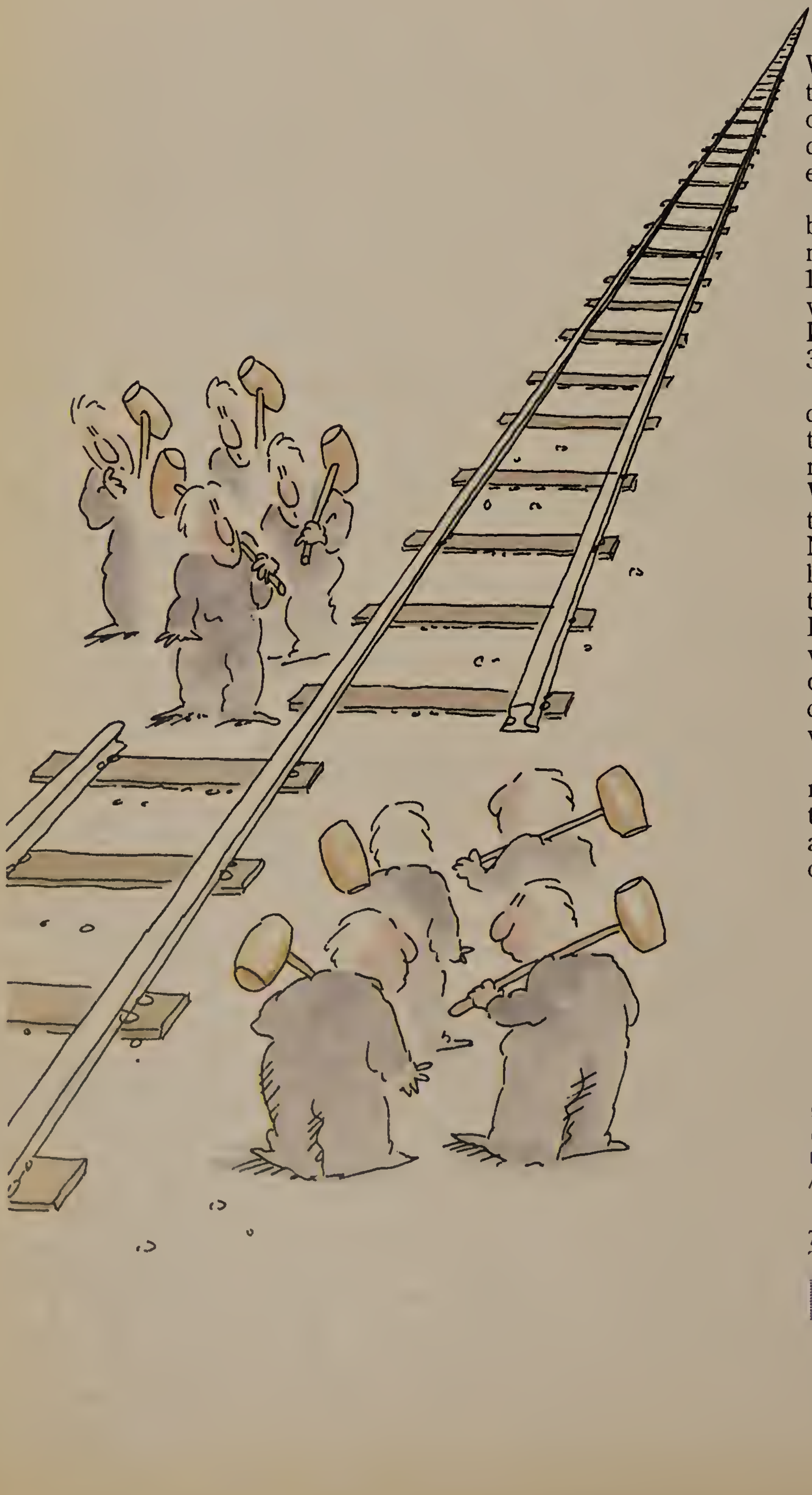
$

BellSouth Advanced Systems, which manages and directs BellSouth Corp.'s customer premises equipment subsidiaries, signed a multiyear agreement with the Telecommunications Division of **Tadiran Electronic Industries, Inc.** of Clearwater, Fla., to distribute the Continuous Communications Systems family of fourth-generation switching systems manufactured by Tadiran.

$

ITT Corp. announced net income for the year 1986 totaling $494 million or $3.23 per share, compared with $294 million or $1.89 per share for 1985.

Net income for the fourth quarter of 1986 was $102 million or 66 cents per share, compared with a loss of $15 million or 14 cents per share in 1985. ◼



WHEN IT COMES TO BUILDING WIDE-AREA NETWORKS, THERE'S NO SUBSTITUTE FOR EXPERIENCE.

While any number of companies can offer to sell you a private wide-area network, one company can offer you 25 years of computer and communications experience along with it. BBN Communications.

Experience that includes designing and building the world's first packet-switching network for the U.S. government back in 1969. Since then, it has evolved into the world's largest wide-area network, the Defense Data Network, connecting over 30,000 users throughout the world.

But the U.S. Government isn't the only customer with tough networking problems that BBN has helped to solve. Numerous major corporations, among them Wang, Weyerhaeuser, and MasterCard, not to mention European giants like England's National Westminster Bank and Italy's largest corporation, ENI, have also found the answers they were looking for from us. Each came to BBN with a unique networking problem—from integrated voice/data transmission to electronic mail to credit authorization—and each came away with a unique networking solution.

If you're going to make a major commitment to a wide-area network vendor, only three things count. Experience, experience, and experience. In wide-area networking only one company delivers it all.

SHOULDN'T YOU BE TALKING TO BBN?

BBN Communications

A Subsidiary of Bolt Beranek and Newman Inc.

70 Fawcett Street, Cambridge, MA 02238
Telephone 617-497-3268 Telex 921470

bbn

TELECOM TRENDS

New Accunet T1.5 rates take effect

AT&T's revised rates for its Accunet T1.5 Service recently took effect. Circuits longer than 102 miles were reduced an average of 26%, while prices for most circuits shorter than 102 miles were increased by 26%.

Users may obtain a 4% discount on pricing for the per-mile portion of the service's intercity channels if they choose a three-year, fixed-term option. Those users who opt for a five-year, fixed-term plan will receive an 8% discount.

▶LEGAL BATTLES

Eaton loses AT&T suit

Decision nabs first large termination charge evader.

BY BOB WALLACE
Senior Editor

CLEVELAND — Capping the biggest challenge yet to AT&T's contract termination fees, Eaton Corp. last week lost a 23-month legal battle to avoid charges for breaking its long-term AT&T equipment lease.

Ruling on a case filed by AT&T, Judge Michael McMonagle of the Court of Common Pleas, Cuyahoga County, ruled that Eaton's Dimension private branch exchange lease was a valid contract.

Eaton had argued, among other things, that the contract was invalid because it was transferred to AT&T from Ohio Bell after divestiture. Eaton had broken off the contract a year before it was due to expire.

McMonagle set Sept. 8 as the date by which representatives from both companies must determine the amount of damages, including termination charges and court costs that Eaton will pay AT&T. An Eaton spokesman said that if a settlement is not reached by this date, a jury trial would be convened to determine the sum. The company declined comment on any other aspect of the suit.

The termination charge is a fee specified in long-term lease contracts that must be paid if the user breaks the contract before it expires.

David Ritchie, general attorney for AT&T, said the company is seeking the full $324,000 in damages it claims Eaton owes. "When it comes to damages, we will prove our case," he said. "We will prove damages totaling $324,000, if not more."

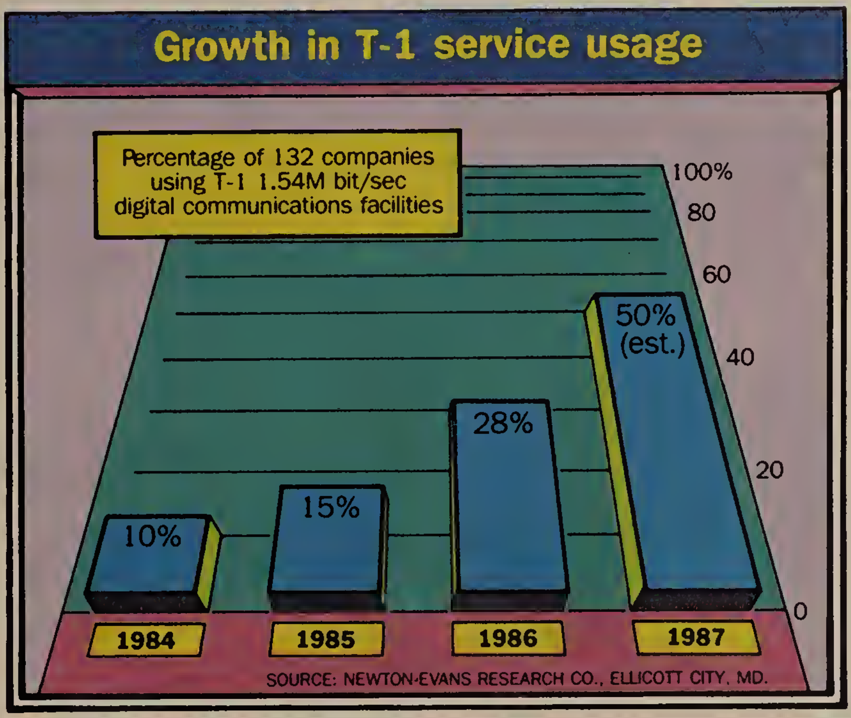
Case under close scrutiny

The Eaton-AT&T case has been closely monitored by other users disputing termination fees with the long-distance giant (See "If sue we must, sue we will, says AT&T," below). Eaton is the largest corporation AT&T has challenged on the volatile issue. Although AT&T has won similar cases in at least five other states, its opponents were predominantly small companies. Ritchie said the list of termination charge lawsuits filed against users is lengthy. He would not, however, say how many cases were outstanding.

The Federal Communications Commission made collecting termination charges from users difficult for AT&T when it ruled that individual states were empowered to determine the validity or invalidity of the lease contracts. Although AT&T has run up a string of victories, attempts to collect termination charges in remaining states could require costly and time-consuming litigation.

"We are hopeful that users will start realizing that a contract is a contract. These contracts are assignable and enforceable as we have proven in state after state," he said.

When asked if winning the Eaton case was the last major hurdle to collecting termination fees from maverick users, Ritchie replied, "We would hope that this decision would put the termination charge issue behind us, but I'm sure it hasn't."


Growth in T-1 service usage

SOURCE: NEWTON-EVANS RESEARCH CO., ELLICOTT CITY, MD.

CROSS TALK

DAVID RITCHIE

'If sue we must, sue we will,' says AT&T

AT&T Information Systems is currently pursuing numerous lawsuits in a regrettable but necessary effort to collect termination charges due the company because of customers' broken promises.

The termination charge is the amount of money a user is asked to pay if he or she ends a long-term private branch exchange lease agreement before the contract is due to expire. The large majority of these contracts were penned prior to divestiture.

Users had argued they should not have to pay termination charges, primarily because, they contended, they entered contracts with the local telephone companies. At divestiture, the contracts were transferred to AT&T Information Systems. Users claimed the contracts were invalidated when they were assigned to AT&T Information Systems.

AT&T Information Systems has been uniformly successful in those lawsuits. That success does not make the effort any less regrettable because AT&T Information Systems is not in the business of litigation. Rather, it is a provider of customer premises equipment and computers and recognizes that lawsuits are not the preferred way to resolve disputes. But if sue we must, sue we will.

AT&T Information System's position is a very straightforward one: A contract is a contract. When a business person enters a contract, he or she knows the consequences of a breach. AT&T Information Systems is doing precisely what any rational business-

See **Sue** page 12

Ritchie is general attorney for AT&T.

▶ AT&T SYSTEM 85

PBX users group gets respect

BY BOB WALLACE
Senior Editor

BALTIMORE — AT&T System 85 private branch exchange regional users group meetings give members an opportunity to discuss specific difficulties encountered with the PBX and AT&T support services — problems that often elicit quick responses from AT&T.

Although System 85 users delineated issues of national concern at the AT&T System 85 National Users Group's recent meeting here, they will address localized issues at regional group assemblages later this year. The AT&T System 85 National Users Group is split into the Eastern, North-Central, South-Central and Western divisions, each of which has its own direct liaison to AT&T. The individual groups meet at least once, and as often as three times each year.

Gary DeLong, communications director for Carter Hawley Hale Stores, Inc. in Los Angeles, and vice-president of the AT&T System 85 National Users Group, claimed AT&T has been responsive to the requests of these users. "At the Western regional meeting last July, users were claiming equipment problems were taking far too long to be fixed. They said their AT&T technicians were unwilling to seek assistance from AT&T's technical support force," he related.

"We polled users at our November meeting, and they said this was no longer an issue. Their AT&T technicians were making many more calls to the second level of AT&T's support group, and the problems were being fixed much faster."

The regional meets always feature an AT&T panel, comprising representatives from different disciplines in that region, that responds to presubmitted questions. "We want the vice-president of operations, a service manager, an area vice-president and a division manager on

See **Users** page 12

Users from **page 11**

each panel," DeLong said. Users can pose unsubmitted questions at the meetings, but AT&T is not required to have definitive answers for them, he added. The regional meetings also feature a panel of users asked to speak about innovative applications using the System 85 and ancillary hardware and software.

DeLong explained that the difference between national and regional issues is not subtle. "At a national meeting, users want to know the future of the PBX and what features may be added to the PBX. Users want to tell AT&T the major problems they have encountered," DeLong explained.

"At regional meetings, users discuss overall support from AT&T. At a 250-person national meeting, it's difficult to talk about a specific user's problem," DeLong continued. "But at a smaller regional meeting, users can really zero in on their specific problems."

DeLong said users interested in joining the Eastern Division should contact Pat Paul of Cornell University at (607) 255-5525. The membership contact for the North-Central Division is Bonnie Kottke of Allied Van Lines, Inc. at (312) 450-2570. The South-Central Division contact is Gene Webb of St. Petersburg, Fla., at (813) 893-7050, and the membership contact for the Western Group is Marcia Beilfuss, who can be reached at (818) 777-7075. ☑

Sue from **page 11**

person must do when confronted with broken promises, it is asserting its rights.

And the courts are recognizing those rights. A jury ruled in AT&T Information Systems' favor in a South Carolina case involving Yellow Cab. ("Vendor hit for termination tab," *NW*, Nov. 3.) Judges have ruled in summary judgments entered in Georgia involving Holiday Inn ("Court orders user to pay termination costs," *NW*, Sept. 15), in Missouri involving Central Controls and in Ohio involving Eaton Corp.

Stipulated judgments that simply reflect customers' belated recognition that a contract is a contract have been entered in Arizona, Idaho, Illinois and Texas. A consultant was enjoined from urging breach of contract in yet another state, California.

Indeed, in no proceeding has AT&T Information Systems lost. Thus, nine states have already been heard from, and every one has agreed that a contract is a contract, that contracts are generally freely assignable, and that the BOCs' contracts were properly assigned to AT&T Information Systems.

Convoluted defenses

Once these principles are recognized, there remain only the convoluted defenses often raised regarding the effect of detariffing. Detariffing occurred when the contracts were transferred from the local telephone companies, which offered tariffed services, to AT&T Information Systems, which now operates in a detariffed environment.

Those defenses are without merit. Detariffing and transfer to a separate subsidiary was not a surprise popped on customers at the last minute. Rather, detariffing for some types of customer premises equipment had been ordered by the FCC as early as May 1979. At that time, the FCC announced a possible plan to detariff and transfer all customer premises equipment. It is a well-recognized principle of law that contracting parties are presumed to enter their contracts in light of the law of the land. And detariffing was the law of the land after May 1979.

Clearly, legal controversy over termination charges produces no benefits to customers or to AT&T Information Systems. AT&T Information Systems has been compelled to undertake significant efforts simply to establish the obvious. But that is now accomplished. Rational businesspeople should now recognize that the costs of litigation are an unavailing drain on them as well as on AT&T Information Systems.

To the extent that customers have guessed wrong about the outcome of the controversy, their disappointment should not be directed at AT&T Information Systems, which simply stood up for its rights. Rather, where appropriate, it should be directed toward those who encouraged the breach of contract.

We of AT&T Information Systems wish to stress that our primary objective in this matter has always been a business objective.

We recognize that customers do have a choice in customer premises equipment. If the customer chooses, we will continue to provide AT&T equipment that was chosen in the competitive customer premises marketplace of the early 1980s. If new equipment is needed, AT&T Information Systems will compete to get that new business by offering a mutually advantageous deal. But the necessary caveat on all this is that customers must recognize that deals do bind both sides, and that AT&T Information Systems has preexisting rights that cannot be ignored. ☑

The 15-Minute Data/Voice Network

Line Miser™ Converts Your Ordinary Phone System Into a Local Area Network

Now you can turn your phone system into a versatile local area network (LAN) for data and voice. It's as easy as plugging in a new telephone. And it takes about that long, too.

Gandalf's new Line Misers enable you to use your existing phone wiring for **simultaneous** voice and data communications. They function as limited distance modems that pass voice transparently. Simple bandwidth allocation is used to separate the data from the voice. Should your PBX fail, the data will not be affected.

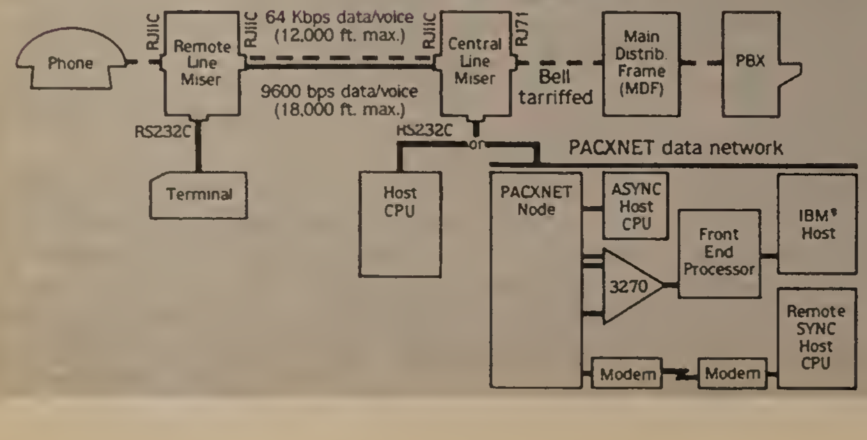
Line Misers provide a fast, cost-effective means of expanding your data terminal network — up to 18,000 feet. Everywhere you have a telephone, you can quickly and easily add a terminal. It's a plug-in job — all you need is a power outlet and a phone jack. No more 4-wire dedicated data lines! Asynchronous full-duplex data rates up to 19.2 Kbps can be handled. Also supports synchronous data at speeds up to 64 Kbps.

What's more, all Line Misers are FCC registered. Gandalf Line Misers let you create your data-over-voice LAN in record time and at a price you can afford. Call your local Gandalf sales representative for details today.

gandalf®

Nobody Supports Networking Like Gandalf.

High speed and rackmount units also available



USA Gandalf Data, Inc. (312) 541-6060
Canada Gandalf Data, Ltd. (613) 226-6500
Holland Gandalf Nederland (020) 867611
Australia Gandalf Pacific Pty. Ltd. 61-2-419-5977
U.K. Gandalf Data Communications Ltd. (0925) 818484

Subsidiaries of Gandalf Technologies Inc.

NETWORK WORLD
THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

Use the
attached form
to get your own
FREE subscription
to
Network World.

You can also use the form to make any necessary changes to your name and address.

DATA DELIVERY

> “Digital Equipment Corp. is doing well, but not because it is selling VAXes into traditional IBM strongholds. Instead, VAXes are moving into the market segment that is growing the fastest: departmental computing.
>
> **Vince Barrett**
> Vice-president
> Gartner Group, Inc.
> Stamford, Conn.

▶ COMBINED APPLICATIONS

Codex introduces modem/mux mix

Device merges functions on multipoint lines.

BY PAUL KORZENIOWSKI
Senior Editor

CANTON, Mass. — Codex Corp. claimed to supply an industry first with a recently announced product that merges modem and multiplexer functions on multipoint lines.

The company's 2630 Dual Multipoint Data Modem enables two independent multipoint applications to be sent over a single unconditioned multipoint leased line. The product is targeted for banking and retail markets.

The 2630 modem uses frequency-division multiplexing techniques to divide the line so it can support two types of applications. The product operates at a speed of 9.6K bit/sec when a host communicates with its branches. That speed can be divided into two channels operating at speeds of 7.2K bit/sec and 2,400 bit/sec.

On the inbound side, the device operates at a speed of 7.2K bit/sec, which can be divided into 4.8K bit/sec and 2,400 bit/sec channels. Bob Ries, senior product planner at Codex, said users typically require faster transmission speeds from a host to the branches. For example, a file may be downloaded from a host to a branch.

The 2630 includes a protocol conversion feature that translates asynchronous communications to synchronous communications. It also features an integral dual-dial restoral option for applications requiring dial backup capabilities. Further, it can be controlled by Codex's existing 4800 series network management systems.

Ries said that, using the new product, a medium-sized bank could support traffic from both a branch automated teller machine network and an on-line teller terminal network over one multipoint line. Banks are one of the largest users of multipoint lines.

Newton Evans Research Co., Inc., a market research firm based in Ellicott City, Md., reported that multipoint leased-line connections account for 54% of the services used by financial companies in 1986.

Ries said the 2630 could also be used by large retail operations in which a user may want to combine point-of-sale and credit authorization applications.

Codex will not market the product as a low-cost alternative to typical modem and multiplexer offerings. Even though it combines two autonomous functions, its price is approximately the same as the cost of buying the two separate items. Ries said customers will save money by eliminating one leased line and modems at certain sites.

Ries claimed that the 2630 was the first product of its kind, saying companies have been unable to produce their own versions because they were unable to perfect a frequency-division multiplexing technique needed with the modem.

“A number of our competitors are hot on our heels, and we expect them to announce

See **Codex** page 14

Survey of 200 potential protocol analyzer buyers

What is the highest speed at which you would use your analyzer?

Below 9.6K bit/sec	5%
9.6K bit/sec	15%
19.2K bit/sec	22%
56K bit/sec	25%
64K bit/sec	10%
72K bit/sec	1%
120K bit/sec	4%
256K bit/sec	1%
1.5M bit/sec	7%
Above 1.5M bit/sec	6%
Other	4%

SOURCE: THE SCHUBERT RESEARCH GROUP, EXTON, PA.

DATA DIALOGUE
PAUL KORZENIOWSKI

Picking peddlers by the pound

Changing partners? An interesting OEM menage a trois has emerged between Codex Corp. and T-1 multiplexer suppliers Avanti Communications Corp. and StrataCom, Inc.

Codex has a glaring hole at the high end of the T-1 multiplexer market. The company currently has an OEM agreement with Avanti, of Newport, R.I., for the Ultramux, a product designed for small and medium-sized networks.

Last month, Avanti announced a high-end offering, Open Network Exchange (ONX), and analysts thought that Codex would also take that as an OEM product. George R. Kushin, senior vice-president at Avanti, said the company is not sure whether it wants Codex as an OEM for the ONX. “At the time we announced the Ultramux, we did not have a large sales and support staff,” he said. “The company has grown since the Ultramux announcement, and it may be more sensible for us to sell the ONX through our own sales staff.” Kushin did not completely rule out a second OEM agreement with Codex.

> Codex has a hole at the high end of the T-1 mux market.

On a recent East Coast trip, StrataCom President Richard Moley visited with Codex officials to discuss how the two companies could best work together. A joint effort makes sense for a number of reasons. StrataCom has the type of high-end product, the Integrated Packet Exchange (IPX), that Codex lacks. StrataCom has been late in getting its product to market and is behind competitors such as Timeplex, Inc. and Network Equipment Technologies Co. (NET).

Moley admitted StrataCom must increase its distribution mechanisms in order to become a key player in the T-1 multiplexer market. Building a sales and support staff would take StrataCom a great deal of time and money. Codex has its own direct sales and support staff, which could be used to push the StrataCom box.

Analysts said that the two companies have already reached an OEM agreement, although both companies deny that any deal has been struck. At the moment, Codex appears to be hedging its bets.

Mark Davies, vice-president of wide-area networking at Codex, admitted that the company has installed and is testing an IPX at its headquarters in Canton, Mass. He said that Codex intends to be a prime player in the T-1 mux market but has not yet fully determined its product strategy. He said that the company may offer a number of multiplexers for the high-end market. He pigeonholed the Avanti ONX for data applications and the StrataCom device for voice applications.

Davies added that Codex is also developing its own T-1 multiplexer and could add that product to its line as well. Davies was clear on one point: There was no possibility of Codex acquiring either Avanti or StrataCom.

Interesting reading. Last month, NET planned to file a public offering of 2,000,000 shares of stock at $12.50 to $14.00 a share. The company has done a fine job of meeting large users' T-1 networking needs, and its client list includes Electronic Data Systems Corp., MCI Communications Corp., Shearson Lehman Brothers, Inc., American Airlines, Inc. and Texaco, Inc. The company has done so well that the shares sold for $24 a share at the offering, and the company sold a few hundred thousand shares more than they had originally planned.

The company's prospectus turned up some interesting facts. The purchase price for ComDesign, Inc., a maker of low-end multiplexers that was acquired last summer, was 1,241,000 shares of stock. ComDesign had seen its year-end revenue dip from

See **Peddlers** page 14

Peddlers from **page 13**

$14 million in 1985 to $11.5 million in 1986, when it experienced a loss of $136,000. The company blamed the decline on the severing of an OEM partnership, which accounted for $2.1 million in sales in fiscal 1985.

To add insult to injury, the partner began selling its own products, which directly compete with Com-Design's offerings.

Also, arch rival Timeplex is none too pleased with NET and has been threatening the company with a lawsuit. Timeplex claims that NET has improperly hired former Timeplex employees, disparaged Timeplex products, misappropriated Timeplex trade secrets and engaged in other unfair acts of competition. The two companies were trying to settle the case without filing litigation.

Something up my sleeve. NET, Timeplex and Digital Communications Associates, Inc. claim to offer T-3 capabilities, which operate at a speed of 45M bit/sec and support 28 T-1 lines. If a customer opened up one of the T-3 products from these companies, he would find a T-3 multiplexer from NEC Corp., which has been selling such equipment to common carriers for a number of years. NEC equipment is reliable but can only be used for simple point-to-point connections. The product is not able to support the dynamic switching capabilities that satisfied customers have come to expect.

The other vendors are merely taking a stopgap measure to supply the few customers who currently need T-3 capabilities. These vendors are working on a more sophisticated T-3 connection.

Timeplex is none too pleased with NET and has been threatening the company with a lawsuit.

Because the market is relatively small right now, the companies are unwilling to spend a lot of research and development money on products that may not show a return on investment until 1988 at the earliest. The vendors claim they plan to integrate T-3 network management information into their network management systems.

To bypass or not to bypass. The justification for bypassing a local exchange carrier is a relatively straightforward situation for commercial customers. If bypass saves the company money, then it should be done. If not, then it shouldn't. Simple, right?

The decision is not as simple for regulated companies and city and state governments. Regulatory agencies have to be careful not to alienate compatriots who also plead their cases before public utility commissions. Often, regulated businesses side with one another in various rate hike cases in the classic style of "You scratch my back, I'll scratch yours." If one business, say a power company, bypasses the local telephone company, it may lose a needed back scratcher.

What's worse is the spurned partner could know enough about the rate-setting process to become a formidable foe. Justifying bypass in such a situation involves politics more than dollars and cents.

State and municipal governments also have to be careful about bypassing a carrier. In many cases, the telephone company is the state's largest employer. A $10 million savings looks great to taxpayers until they are handed a pink slip on payday.

The political repercussions in such a scenario are great enough to make even the stingiest elected official think twice or even three times about bypass. There aren't too many politicians who support higher unemployment. Such folks aren't elected for more than one term. ☑

Codex from **page 13**

similar products soon," Ries said. He added that Codex presently has at most a 12-month jump on its competitors.

Codex plans to market the product through its direct sales force. It is currently available, and a production version was shipped for beta testing last month to a bank with autonomous ATM and teller networks.

The company plans eventually to add some bells and whistles to the 2630, such as support for higher speed communications and an automatic fallback feature. If there was a problem on a line, such as jitter, the device would automatically begin transmitting at a slower speed.

Pricing

Prices for the 2630 range from $4,200 for a two-port model to $5,400 for a model with six channels. ☑

Improve your lines of communication...

with LDX NET.

When American business needs private line service it talks to LDX NET. That's because at LDX NET we do one thing and we do it better than anyone else.

We provide private line services — the key to the integration of voice, data and video telecommunications. And, we do it through our own national network and fiber optic technology.

That means LDX NET business customers are getting the finest, most sophisticated private line services available.

Because we provide total end-to-end service and monitor and control every leg of your circuit, you're assured of the highest degree of reliability and performance. And we back our technical capabilities with a commitment to serve your needs. Should a problem occur, we'll know it immediately. And, we'll call you, before you call us. Your business communications will be clear, accurate, secure — and affordable!

And, through our fiber optic network, we can extend your lines of communication to major metropolitan areas throughout the nation.

So, if you want to improve your lines of communication — talk to LDX NET.

LDX NET

America's Private Line Specialist

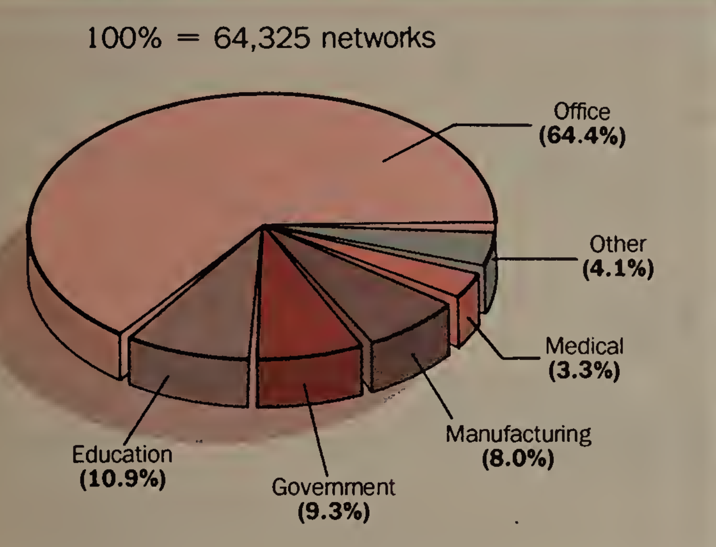
15450 South Outer Forty Road / Chesterfield, Missouri 63017 / (314) 537-8000

LOCAL NETWORKING

MAP forum available all day

Factory network implementers can participate in a free, ongoing computer conference on the Manufacturing Automation Protocol and the Factory Data Management system from D.L. Hiller and Associates, Inc. of Sterling Heights, Mich. The computer forum, dubbed FADMAP, is available 24 hours a day at (313) 465-6761. Participants should dial up at 300 or 1,200 baud.

Worldwide installation of personal computer networks



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

DIVERSE NETWORKS

Campus runs on broadband power

BY JOSH GONZE
Staff Writer

FAIRFAX, Va. — Six years ago, computing services personnel at George Mason University here became interested in local communications and dove into the pool of products then on the market. A year later, they surfaced with a broadband, mid-split coaxial-cable local-area network that today supports 1,000 nodes in 30 buildings on two campuses.

Today, the schools' director of network communications services, Byron Peters, says the planners made the right choice and that only broadband could support his current needs. MasonNet, as the system is dubbed, is a video and data superhighway, enabling students, faculty and administrative staff to access equipment on either the university's main or remote campus, or

See **Broadband** page 16

NOVELL

NetWare gets new look

System Fault Tolerant, 2.1 versions bow.

BY PAULA MUSICH
Senior Editor

SALT LAKE CITY, Utah — Novell, Inc.'s NetWare will get a major face-lift in the third quarter of this year with the release of Version 2.1 of NetWare and System Fault Tolerant (SFT) NetWare.

Novell used its recent NetWare affiliates conference as a platform to discuss the new NetWare Version 2.1 and to encourage developers to start planning new programs that will take advantage of the enhancements.

A new class of programs that Novell defined and encouraged developers to address is Value Added Processes (VAP). These third-party programs, for which Novell will provide the necessary hooks and specifications, are executable modules that are loaded by NetWare during program initialization.

"A VAP provides some kind of value-added service to the network in a dedicated or nondedicated workstation or in the file server," explained Lewis Heaps, product marketing manager.

"A VAP could be written for print serving. Another could be written that would interface to a laser disk serving as a law library for looking up information pertaining to a given case," he said.

NetWare Version 2.1 will also define Value Added Drivers (VAD), which will allow third-party disk subsystems to be used in a NetWare286 network. This capability is currently only supported with NetWare86. It will be up to third-party disk manufacturers to write drivers for their disk subsystems, but Novell will test these VADs to ensure that they function correctly with Version 2.1. Novell will also begin supporting embedded small computer system interface disk drives.

Another planned enhancement will add guaranteed packet delivery to NetWare's Internetwork Packet Exchange Protocol. The Sequence Packet Exchange (SPX) protocol specification acknowledges to an information sender that a packet has been received. IPX provides only datagram services, "a send-and-pray type of protocol," said Larry Stephenson, executive vice-president at Gateway Communications, Inc. of Irvine, Calif.

Novell will upgrade NetWare printer-spooling capabilities to full queuing functions with a queuing protocol that will add greater flexibility in defining batch-type jobs to be serviced in the network. "I can define the type of job it is, the type of server that I want to have service that job, when I want to have it serviced and so on," said Heaps.

SFT NetWare Version 2.1 will be enhanced to allow error and performance statistics to be collected, accounting information to be kept for network use charges and user log-in restrictions to be employed.

Although no firm pricing has yet been established, Novell's standard upgrade fee is $495, plus the difference in cost between the operating systems (NetWare vs. SFT NetWare Levels I and II).

LANMARKS

PAULA MUSICH

When is a standard really a standard?

The proliferation of networking standards, both de jure and de facto, has caused many vendors and users to throw around standards terms casually. The term "industry standard" itself is a buzzword that has been bastardized to the point of meaninglessness.

Take, for example, the IEEE's 802.3 standard (also commonly referred to as Ethernet). A product that is IEEE 802.3-compatible could employ baseband signaling over thick and thin coaxial cable as well as unshielded twisted-pair cable, or it could employ broadband signaling over community antenna television cable.

It could also specify as its top theoretical data rate 1M bit/sec or 10M bit/sec — although some vendors claim to offer broadband Ethernet-compatible networks that support 5M bit/sec data rates.

Beyond 802.3, there is 802.4, 802.5, MAP/TOP, OSI, TCP/IP, FDDI, X.25, X.400, ad nauseam — all meaningless acronyms when considered on a superficial level.

Given the number of options the buyer has to work with in the standards arena, not to mention the number of different implementations of the same protocol set, it's necessary for the buyer to become more versed in what makes up a standard — both existing and pending. Vendors are quick to label specifications being considered for standardization as standards.

It's not enough to require that the vendor's product literature say 802.-whatever or Open Systems Interconnect-compatible.

Refusing to buy from vendors that don't support a given networking standard (as General Motors Corp. and the U.S. government have done) may help a little, but this practice alone does not ensure that products from two different vendors complying with the so-called standard will talk to each other.

When attempting to bring the equipment of different vendors together in a network and ensure that they communicate, the potential buyer should ask to see such combinations in actual operation and talk to users who have worked with such combinations.

If that isn't possible, a buyer should install the equipment on a trial basis and test the communications capabilities before totally committing to the scheme.

These aren't easy, cheap or quick suggestions for ensuring multivendor connectivity, but they are necessary now and will be for some time.

Broadband from **page 15**

on any of several gatewayed nets.

MasonNet's 1,000 nodes include 700 on the broadband, a Sytek, Inc. LocalNet/20, and 300 on a linked Micom Systems, Inc. Micro 600 data switch. The nodes on the broadband include 250 personal computers, 250 terminals, 200 computer ports and some printers and plotters. The personal computers are IBM Personal Computers, Leading Edge Hardware Products, Inc. Model Ds, Televideo Systems, Inc. Televideos and George Mason-assembled IBM Personal Computer XT clones. The terminals hardwired to the gatewayed data switch are Hewlett-Packard Co. 262Xs, Televideo 925s and Lear Siegler, Inc. ADM 22s.

Among the diverse applications MasonNet runs are six television channels, two 300 KHz subchannels for data, gateways to two national networks, another local net at the remote campus and the data switch. The six TV channels offer instructional video and audio, including two cooperative engineering classes beamed by satellite from other Virginia universities, and three channels of a Washington, D.C.-based political affairs cable network called The Capitol Connection.

Peters explained why a baseband local-area network could not properly serve his needs by saying that "given a multimedia requirement, it's more appropriate to have a broadband backbone. Baseband has its applications at higher speeds, especially for host-to-host transmissions, but it is wasted in a terminal-to-host environment."

He pointed to his need for teleconferencing, diverse applications and network expansion. Broadband was his choice because "you can have all sorts of stuff on the same cable. Broadband allows alternatives that baseband doesn't." Nor would baseband cut his costs, he claimed. This is partly because he designed MasonNet himself, a job he assumed voluntarily.

"I think that the difficulty in putting a system together is a bit overblown," he said. "There's sort of a mystique surrounding it. But if you have a good grounding in electronics, it's not so bad."

Today, the network's power is distributed among an average of 200 users logged on at any one time, and between two subsystems, academics and administration. These two subsystems are autonomous, but a Sytek bridge enables transparent access from one to another. Theoretically, the network could support up to 2,000 users, but given the bursty nature of MasonNet traffic, Peters says, 1,500 sessions is the realistic maximum.

Careful design allowed placement of a network tap in each classroom. Instructors can wheel personal computers on carts to their students and hook into the system. The LocalNet/20 allows placement of a modem box anywhere without changing its network address.

All nodes run asynchronously over five miles of coaxial cable that runs down the center of hallways and through risers inside, and through buried conduits outside. Access is afforded through carrier-sense multiple access with collision detection (CSMA/CD), which Peters says he prefers to a token-ring access method because the bursty traffic on his network works well with CSMA/CD. He pointed to lower overhead as well as ease of design and implementation. A token ring, he says, is appropriate for high-speed host-to-host activity, "but it is overkill in a terminal-to-host environment."

A smaller Localnet/20 network occupies a remote metro campus 10 miles away in Arlington, Va The two LocalNet/20s are connected with 56K bit/sec digital data service lines leased from the local Bell operating company, Chesapeake and Potomac Telephone Co.

All network traffic is shuttled through one of three Sytek model 50/50 frequency translators, one at the main campus head end, one at the metro campus head end and one backup, also at the main campus. Peters says he has never experienced a translator failure.

Peters is not intimidated by the challenge of monitoring his network. He has a configuration program on a Sytek Network Control Center that runs at 3 a.m. every morning. It lists whether any port parameters changed, whether any units failed to respond to a configuration query and if anybody has received privileges to enter restricted areas of the network.

Peters just started using an Intech Communications network management package that runs on a VAX. This package keeps track of the individual network interface units and packet communications units and warns when equipment needs to be replaced. It also complements the older Sytek system.

George Mason has received national attention as an up-and-coming technical university. Asked what part the campus computer network played in sparking that growth, Peters said, "In the process of implementing something new like a network, we found we're out there in front. Being able to provide good networking services has meant we can do things that other places can't." ◻

Now Network World puts a powerful new research tool right at your fingertips.

Network World's new SearchLink service gives you easy access to more than 800 databases in just minutes!

There's a wealth of useful information being gathered on electronic databases every day. But getting access to it hasn't been easy. What databases have the answers you need? How do you get access to them?

The answer is SearchLink. SearchLink gets you answers to all kinds of questions that are important to your business. You can get competitive information, or details about new products and services, or market facts, or the latest FCC regulations. You can get information on computers, finance, business statistics, investments, law and much more. Everything from accounting to trademarks to history or geography.

SearchLink offers you easy access to the services of leading database vendors including BRS; Dialog; NewsNet; SDC; VU/TEXT; and Questel, to name just a few. All you need is a credit card and a computer with modem.

All this, and more, with just one call!

SearchLink is easy.

No subscriptions. No passwords. All you do is call 800-843-7337 with your modem. Have your major credit card ready, and within a few minutes you'll be cleared to use SearchLink. Simple instructions tell you how to go after the information you need.

Using SearchLink is as easy as knowing what you want to find out. You pick the subject; SearchLink shows you what's available. Then you pick what you want to see.

If you know which database you want to access, SearchLink lets you specify that. If you're not sure, SearchLink can choose the database(s) to search.

SearchLink is inexpensive.

Considering that you could easily spend hundreds of dollars worth of your time with conventional research methods and still not get what you want, SearchLink could be the biggest bargain going. SearchLink costs only $7.99 per topic searched (a few databases carry surcharges), plus 25 cents per minute connect time, and $2 per abstract you choose to see. You can even get hard copies if you want them.

SearchLink provides 24-hour on-line assistance.

If you get into trouble, just type "SOS" and a real, live search specialist will come on-line to answer your questions.

Here's just a small sample of the databases you can access through SearchLink. A complete list is available on-line on SearchLink.

We can't list all of SearchLink's more than 800 databases, but just to give you an idea, here are *some* of the databases available under the topic "COMPUTER."

Business Software Database
Software Packages for Minis and Micros
COMPENDEX*
Engineering and Technology Information
Computer Database
Computers and Telecommunications
COMPUTERPAT
U.S. Data Processing Patents
INSPEC
High Technology Topics
Menu—The International Software Database
International Software Listings
Microcomputer Index
Business, Education, and Home Computer Topics
Online Microcomputer Software
Software Descriptions and Reviews
SUPERTECH
AI, CAD/CAM, Robotics, and Telecommunications

And here are just a few of the other popular databases you can access with SearchLink:

ABI/INFORM
Business and Management Topics
Chemical Abstracts
Index of Chemistry Articles
Disclosure
(Selected Databases)
Donnelley Demographics
U.S. Census Information
Dun & Bradstreet
(Selected Databases)
ERIC
Educational Topics
PTS PROMPT
Business and Market Information
Standard and Poor's Corporate Descriptions
Information on U.S. Corporations
Trademarkscan
Active U.S. Trademarks
TRINET
Information on U.S. Companies

Here are some of the major database vendors accessible through SearchLink:

ADP Network Services
BRS Information Technologies
Data-Star
Datasolve Information Online
DataTimes Information Network
Dialog Information Services, Inc.
G-Cam Serveur
NewsNet, Inc.
Pergamon InfoLine
Questel, Inc.
SDC Information Services
VU/TEXT Information Services

Call 800-843-7337 now!

Put the power of knowledge to work for you right now. Call 800-843-7337 (THE-SEER) on your computer and get the answers you need to stay ahead.

SEARCHLINK
From Network World
Your link to the world of information.

An International Data Group Service
SearchLink is sponsored by the National Federation of Abstracting and Information Services.
NFAIS is a professional association of database producers.

NETWORK WORLD
A CW Publication
An International Data Group Company

COMMUNICATIONS MANAGER

Interviewing by video

"So kid, just look into the camera and tell me why you want to work for Harris Corp."

Harris Corp. used a prototype two-way video satellite network to interview a dozen engineering students on the campus of the Georgia Institute of Technology in Atlanta, Ga., from its headquarters in Melbourne, Fla. The video teleconferencing hookup consists of a screen and a camera at each site linked via Harris Corp.'s Ku-band satellite earth stations.

Universities sponsoring telecommunications research centers and programs

Institution	Program
Harvard University	Program on Information Resources Policy — Exploring change and developing policy options in information resources.
Massachusetts Institute of Technology	MIT Research Program on Communications Policy — Interdisciplinary research and analysis center, focusing on communications issues.
Polytechnic University	Center for Advanced Technology in Telecommunications — Collaborative programs working with private sector in research, development, education and technology transfer.
Stanford University	Information Policy, Engineering - Economic Systems Program — Analyzing national and international policies concerning information services and products.
University of Pennsylvania	Communications Program — Studying telecommunications policy, offers graduate degrees.
University of Southern California	Communications Management/Communications Theory and Research — Maintaining ongoing communications research programs, offers graduate degrees.

▶ PROFILE

Del Monte's Candy Rodgers

Manager calls her job an avocation.

BY BOB HAMEL
Senior Editor

SAN FRANCISCO — For Candy Rodgers, corporate telecommunications manager for Del Monte USA, managing a telecommunications staff, rallying fellow users and teaching the tools of the telephony trade are avocations.

Rodgers and her staff of six plan to save the canned fruit and vegetable corporation, based here, some $400,000 by renegotiating contracts, downsizing equipment and designing on-line sales and administrative networks to streamline Del Monte's telecommunications network.

The self-styled "intrapreneur," who has amassed 20 years of experience in the telecommunications industry, currently manages a staff that has worked together for just a year.

Rodgers also serves as president of ProTel, a fledgling local Bay Area telecommunications users group that has grown in size from 25 to 200 members in its first year.

In her spare time, she teaches telecommunications for National University's MBA/certificate program in that discipline.

"An intrapreneur is someone who takes on the responsibility of a job as an avocation," she said. "I get involved in getting results." Rodgers is personally involved in bringing change and new ideas to the telecommunications industry.

She bases her success on being oriented to the growth and development of herself and those around her. Throughout her long career in telecommunications, she has learned from both good and bad managers.

"I try to give people a free rein. I coach them. I'm not an authoritarian," she noted. Rodgers considers herself a networker, rather than a hierarchical manager. The most important aspect of her managing style is, in her words, to "freely give to others what has been given to me."

As a manager, Rodgers lets her staff individually evaluate their positions and establish yearly goals and objectives. "I sit down with each staff member, and we jointly refine and develop projects for the upcoming year," she said.

In 1985, Del Monte recognized a need to keep closer tabs on its telecommunications costs. That October, it lured Rodgers away from her position as telecommunications manager for Apple Computer, Inc.

"We are the planning group for telecommunications in Del Monte. We do all the paperwork for the corporate and remote sites," she

See **Rodgers** page 21

ASSOCIATIONS

The National SL-1 Users Association, Inc. will hold its national meeting on April 21 to 24 at the Hyatt O'Hare in Chicago. The meeting will offer 22 workshops and addresses by national officers and Northern Telecom, Inc.'s upper level managers. For information, contact Gary Rea at (216) 425-8903.

The resolution committee of the National Rolm Users Group (NRUG) will meet April 23 and 24 to identify and sort out Rolm Corp. users' concerns. NRUG will elect officers and conduct a business meeting at the International Communications Association (ICA) Conference in New Orleans on May 21 and 22.

NRUG's second annual fall conference will be held Oct. 7, 8 and 9 at Rolm headquarters in Santa Clara, Calif. The conference will offer speakers from Rolm, product seminars to help users avoid Rolm equipment problems and the formal presentation of resolutions developed by the resolution committee.

The NEAX 2400 Users Group will hold a three-day meeting at the Innisbrook Resort in Tarpon Springs, Fla., from May 27 to 29. The agenda includes one full day of workshops.

Users will give presentations and exchange ideas on a variety of technologies, and open discussions with NEC America, Inc. and NEC Information Systems will be held. Information on the meeting is available from Helen Waicunas at (203) 241-6678.

See **Associations** page 20

GUIDELINES

BOB HAMEL

Delegate, don't dally!

A staff is only as good as the manager who directs the operation. Missed deadlines, a paper pileup or unfocused reporting often indicate a management style that is deficient in delegation.

Proper delegation involves taking risks and matching staff to projects. It is grounded in creating a suitable work environment, enabling work without interference and becoming motivated by results, not methods.

When delegating, the communications manager is taking a risk by placing his own authority in the hands of subordinates. To some, that's a scary proposition.

The ability to let a worker do challenging work the manager might think only he can do is the first step in management through delegation. Delegation without risk is no delegation at all.

Once the manager commits himself to delegation, he must determine which staff member is best suited for the delegated task.

According to Stephanie Winston in her book, *The Organized Executive*, the cardinal rule of delegation is to "assign tasks to the most junior person with the skills and rank necessary to complete the assignment successfully."

This method allows a manager's more experienced people to work on projects that match their skills, and it gives the junior-level member something to shoot for, such as more responsibility and more challenge in successive projects.

How authority and control are delegated is as important as to whom it is granted. Two accepted methods currently favored are the "assembly line" method and the "whole job" method.

In the assembly line method, the manager provides several staff members with distinct parts of a project, which create the whole when assembled.

In a whole job process, the manager delegates the entire process to one staff member. The method to use often depends on the staff's ability and the subject at hand.

Sometimes, it is possible to combine the processes into a team effort with junior- and senior-level staff. The senior staff member in charge of the overall project provides junior staff members with selected portions of the project.

This fosters teamwork and allows senior staff members to hone delegatory skills. It also acts as a training tool because junior members learn with senior supervision.

See **Delegate** page 20

“We operate in four states. Used to be five if you count the state of confusion.”

—A Network Manager commenting
on his state of affairs.

Piling one leased line on top of another to expand a network or fix a problem can add up to a state of confusion. Many Network Managers have discovered a better way. Telenet.

With Telenet you can operate one network for your synchronous and asynchronous applications. And design it in a way that fits your needs best. Telenet can build you a dedicated network to link your existing systems. Or link you to our public network to tie in your remote locations even if they're international. Or design a combination for maximum cost efficiency. Plus we provide a network control center with sophisticated diagnostics to facilitate troubleshooting and monthly reporting. Better yet, our dynamic alternate routing assures reliability that can surpass leased lines.

Telenet operates the world's largest public data network which supports more than 1000 virtual private networks. And we've developed and installed more than 70 dedicated networks for corporations, government agencies and countries around the world. If piling one leased line atop another has put your network in a state of confusion, have your computer call ours today.

TO REACH TELENET VIA TELEMAIL®:

- With a PC or terminal supporting asynchronous communications, using your modem, dial 1-800-424-9494.
- Wait for connection, then press carriage return (CR) twice.
- At TERMINAL=press CR.
- At @ type MAIL press CR.
- At USER NAME? Type BETTER.WAY press CR.
- At PASSWORD? type TELEMAIL press CR.

Or call us at 1-800-TELENET. Or send us your name and address via Telex: 248419.

Telenet

A US Sprint Company

SENDING DATA TO WORK FOR YOU.℠

©1986 Telenet Communications Corporation. US Sprint Communications Company is a GTE/United Telecommunications Partnership.

PEOPLE

William C. Wimer has joined the Interface Group as director of MIS.

Wimer will be responsible for both the company's MIS operations and its telecommunicatons functions.

With more than 30 years of experience in corporate information systems management, Wimer most recently served as vice-president of MIS for Fanny Farmer Candy Shops, where he was responsible for the company's MIS and communications functions.

In addition to his role as vice-president, Wimer served for nine months as the company's chief financial officer.

Associations from **page 17**

The IBX Users Group Association will hold its 12th meeting from April 29 to May 1 at the Irvine Marriott in Irvine, Calif.

Manufacturer representatives and IBX users from major corporations and universities are expected to attend.

All IBX users are welcome and encouraged to attend the meeting. Reservations and information are available from Elizabeth Stockwell at Wang Laboratories, Inc., (617) 967-5069.

Two new disaster recovery facilities were announced at January's annual Users Group Conference of Comdisco Disaster Recovery Services, Inc.

A California facility will serve West Coast and Alaska customers, while a New Jersey facility will serve Mid-Atlantic customers.

Plans for further expansion were discussed at the conference, which was attended by more than 400 people.

The company's 1988 Users Group Conference will be held in Naples, Fla., in the first week of February. Information is available from John Jackson at Comdisco Disaster Recovery Services, Inc., 6400 Shafer Court, Rosemont, Ill. 60018 (312) 698-3000.

The ICA will hold an "Executive Program" at the 1987 Conference & Exposition, May 17 to 22, in New Orleans. The program is a seminar designed for top telecommunications executives to meet and exchange strategies and ideas.

Gideon Gartner, chairman and chief executive officer of Gartner Group, Inc., will be one of three speakers at the session. ◻

Delegate from **page 17**

Once the project is delegated and running smoothly, the manager has an important task — to step back and let his people do their work.

Managerial mistakes

Having the time to answer questions, give direction and provide sufficient opportunity and material is the manager's responsibility.

A meddlesome manager who constantly checks to see "how it's going" runs the risk of frustrating and alienating his staff by being too involved.

An aloof manager runs the same risk by being unavailable. If the staff is well-trained and used to being challenged, it will do the job — without management's help. Remember, work won't take place in a vacuum or a hurricane.

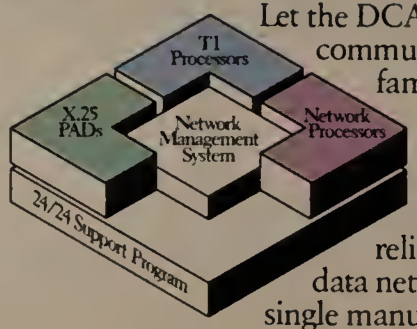
By setting a standard for results and not enforcing strict adherence to methods ("Do it my way because I'm the boss"), a manager lets the staff prove its methods can be successful. A manager is more valuable if he analyzes results than if he controls the methods to achieve them.

For all projects, the goals, time lines and deadlines must be worked out between the staff and the manager. Producing results that benefit not only the department but the company as a whole is of paramount importance.

Finding the right people to do the jobs and letting them work effectively are the keys to proper staff management through delegation. ◻

Finally, a major network
with innovative family programming.

DCA. The network everyone's watching.



Let the DCA Network bring your communications networking family together. With family programming all our own that has resulted in the most comprehensive and reliable integrated voice/data network offered by a single manufacturer today.

Rodgers from **page 17**

said. "We audit, refine and manage the telecommunications system."

Her objectives for 1987 are threefold: Reduce overall telecommunications expenses, enhance communications services and develop a fully allocated chargeback system.

She has decided to slash telecommunications costs by replacing the corporate headquarters' four-module AT&T Dimension 2000 PBX switch with a smaller three-module AT&T Dimension 2000 switch.

"The lease has expired on the current PBX, and we're being billed on a costly month-to-month basis," Rodgers related. In addition, Rodgers indicated the switch configuration is oversized for the corporate headquarters' needs.

"We're only serving 1,200 users on the system," she said. Replacing the four-module Dimension 2000 switch with a three-module Dimension 2000 switch will result in a monthly saving of $17,000, Rodgers estimated.

She negotiated with a leasing company to acquire a smaller switch for about 40% less than the cost of the present switch. The leasing company will bundle the installation costs with the package and extend payments over a three-year period.

Another project of Rodgers' is to renegotiate contracts for or replace 65 remote site PBXs and key systems that are being billed on a month-to-month basis.

She estimates a $400,000 savings over the next four years by renegotiating leasing agreements using the company's existing Harris-/Lanier, Fujitsu, Ltd. and NEC equipment, and by either downsizing the remote site configurations or replacing the switches with an alternative from the three vendors.

Managing data communications is also part of Rodgers' reponsibilities. She is now creating two on-line leased-line networks, one to serve Del Monte sales locations and one for the company's canning plants and distribution locations.

The networks will replace AT&T dial-up modems with an on-line system that will provide users with access to the company's IBM mainframes.

"By converting to leased lines from dial-up modems, we won't save much in telecommunications costs, but we'll provide much quicker and better service to our sales brokers," Rodgers explained.

"We've helped members find ways to cut costs."

As president of ProTel, Rodgers has helped create a forum for telecommunications professionals in the San Francisco Bay Area. "ProTel is different from other telecommunications groups," Rodgers said. "Unlike users groups banding around a vendor's product, ProTel is open to users handling all areas of telecommunications."

ProTel's member list includes PBX users and administrators, vendor representatives, consultants and students.

The group has sponsored job fairs, held seminars on industry and management issues and provided career counseling. "As a telecommunications network, we've helped members find ways to cut communications costs and have passed along sales leads," she said.

Currently, Rodgers is involved in defining the roles of positions within the group. "Since it's a volunteer organization, it's important to let members know up front what's expected of them as committee members or as board members."

She said she is hoping membership will increase dramatically in 1987. ◘

Featuring DCA's System 9000–the Cohesive T1 network you simply cannot outgrow. And our Series 300 Network Processor, whose advanced data routing abilities continue to set new standards for reliability and connectivity in multi-vendor environments. Our DPAX X.25 PAD, whose throughput and high performance consistently bring standing ovations. And our comprehensive Network Management Systems which put centralized monitoring and control of all members of our product family right at your fingertips. All backed by DCA's unique 24/24 two-year support program.

No wonder DCA is the network everyone's watching.

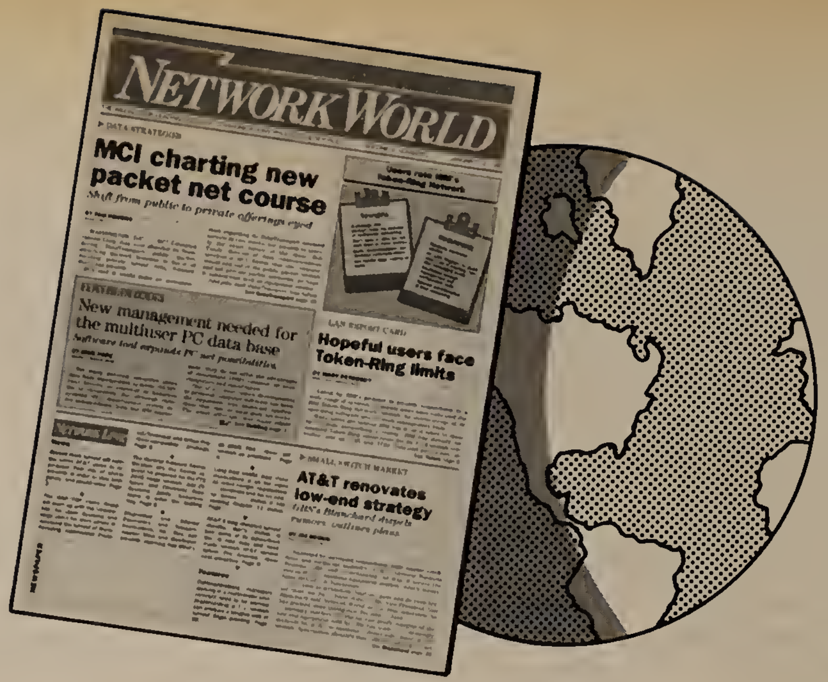
To meet our growing family, just call toll-free, ext. 515 today. And we'll send you our complete network picture.

1-800-241-4762*

dca®

The Network Everyone's Watching.

DCA is a registered trademark and 24/24 is a trademark of Digital Communications Associates, Inc.
©1987 DCA, Inc.
*In Georgia, call 1-404-442-4500.


NETWORK WORLD
MCI charting new packet net course
New management needed for the multiuser PC data base
Hopeful users face Token-Ring limits
AT&T renovates low-end strategy

As networking takes over the world, Network World takes over the market.

The trend has never been clearer. Networking is now the major application market for communications. And a recent statement by Ken Olsen, President and Founder of Digital Equipment Corporation, substantiates this trend: "We have to start thinking of the computers as peripherals. You start with the network, then you hang the computers on later."

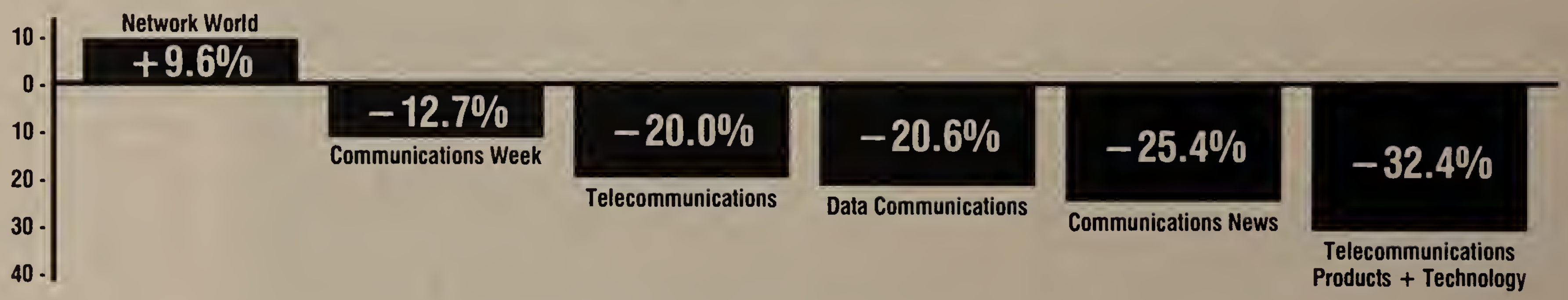
Networking. It's been *Network World's* focus from the very start. In fact, it is the *only* publication that covers the entire realm of communications from the networking point of view. And in doing so, *Network World* has established itself as the *standard* for communications users already networked or planning to network.

Today's users know they need up-to-date information in order to keep pace with the evolving world of networking. That's why they read *Network World*. And that's why *Network World* was the only publication to gain in regular readership in an independent study conducted among ICA (International Communications Association) members, some of the nation's most influential buying decision-makers for voice and data communications products and services.

The study, sponsored by a multi-billion dollar networking company and conducted in January 1987 by First Market Research of Boston, showed decreased readership of all communications-oriented publications among ICA members since a previous study in July 1986. Only *Network World,* with its exclusive networking-oriented coverage, experienced an increase in regular readership. The percentage increase/decrease for each publication over that six-month period is displayed in the following chart.

Percentage Change in Regular Readership* among ICA Members

(July 1986 vs. January 1987)



*Regular readership is defined as reading three or four issues out of the last four issues of a given publication.

Source: Two independent studies, each sponsored by a multi-billion dollar networking company and conducted among ICA members by First Market Research of Boston, July 1986 and January 1987.

Because networking is your business, we've made it our business. No other publication looks at the world of networking like we do. Today the network is the market – and the market reads *Network World.*

NETWORK WORLD

The Weekly for Leading Users of Communications Products & Services

375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700

A CWCI Publication
An International Data Group Company

NEW PRODUCTS AND SERVICES

See inside for:
▶Package that links VAX to IBM
▶Local net version of POS system
▶Disk expansion kit for Deskpro

▶PACKET SWITCHING

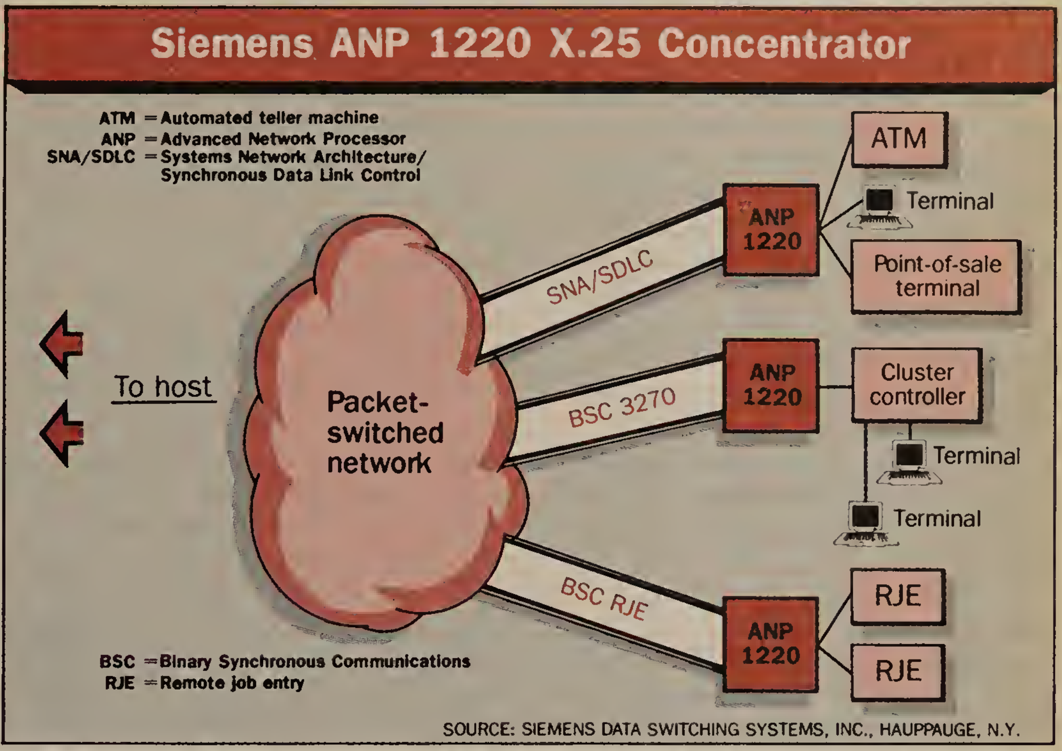
Device allows X.25 line mix

BY JIM BROWN
New Products Editor

HAUPPAUGE, N.Y. — Continuing its efforts to crack the user market, Siemens Data Switching Systems, Inc. introduced a device that allows three attached devices to share a single access line to an X.25 packet-switched network.

The firm's Advanced Network Processor 1220 (ANP 1220), an X.25 concentrator, reportedly supports IBM's Binary Synchronous Communications protocols used in 3270 interactive applications, as well as IBM's 2780, 2770, 3780, 3770 and 3740 BSC remote job entry (RJE) protocols.

See **Device** page 25


Siemens ANP 1220 X.25 Concentrator

SOURCE: SIEMENS DATA SWITCHING SYSTEMS, INC., HAUPPAUGE, N.Y.

▶DATA BASE MANAGEMENT

Ingres DBMS bows for PCs

BY JIM BROWN
New Products Editor

ALAMEDA, Calif. — Relational Technology, Inc. recently released its Ingres relational data base management system for IBM Personal Computers.

Compatible with IBM's DB2 mainframe-resident DBMS, the six-module package allows personal computer users to download minicomputer and mainframe host-resident Ingres data base files and to process them as part of Ingres applications running on a personal computer.

The package also allows personal computer users to directly download converted host-resident Ingres data base files into personal computer applications such as Lotus Development Corp.'s 1-2-3 spreadsheet.

In addition, the package enables users to create stand-alone personal computer DBMSs and to use the personal computer to develop Ingres applications that can be ported over to Digital Equipment Corp. VAX minicomputers, IBM mainframes and Unix-based hosts.

The personal computer-resident modules include a user interface similar to Ingres host packages and a DBMS that treats Ingres data bases as PC-DOS files.

Other modules include a fourth-generation language that supports application development and an embedded Structured English Query Language (SQL) that converts personal computer-generated requests for data into SQL statements understandable by host Ingres packages.

Lastly, the firm offered a network module connecting the personal computer to host-resident Ingres packages and PC/Link. PC/Link downloads Ingres host data base files that have been converted to personal computer format by a host-resident PC/Link module.

Relational Technology also announced that it will integrate the Baton Rouge, La.-based Communications Research Group's Blast asynchronous communications package into Ingres/Net and Ingres/Star.

Ingres/Net connects Ingres packages running on different hosts, while Ingres/Star allows a single SQL statement to retrieve data residing on multiple host systems.

According to Relational Technology, processing host-resident data with personal computer-based Ingres applications reduces the burden on the host. Ingres for the Personal Computer only puts a strain on the host when data base files are being accessed, while terminal emulators require total use of the host's application and processing power.

Ingres for the Personal Computer runs as a memory-resident program requiring 640K bytes of random-access memory and at least 5M bytes of storage.

The modules comprising Ingres for the Personal Computer range in price from $200 to $2,000. A stand-alone system, including the user interface and data base management modules, costs $1,200.

An application development system is $2,000. The user interface and Ingres/Net modules needed to access data residing on a host system cost $650. The personal computer-based PC/Link module costs $200, while host-resident PC/Link modules range from $2,000 to $14,000.

Relational Technology, Inc. is headquartered at 1080 Marina Village Pkwy., Alameda, Calif. 94501 (415) 769-1400. ◻

▶TELLABS

Crossnet gives users DACS power

Multiplexer system is unveiled.

LISLE, Ill. — Tellabs, Inc. recently introduced its Crossnet System, a combination of T-1 multiplexing and switching equipment aimed at giving end users Digital Access and Cross-connect System (DACS) capabilities.

The Crossnet System includes a T-1 multiplexer node, which uses bit-interleaved time-division multiplexing techniques to insert up to 128 incoming voice, data and video channels on a single T-1 line. The system also contains a switching node that will switch up to 16 T-1 lines between remote Crossnet Systems.

AT&T's Data Systems Division lent technical support in the development of the system that AT&T will reportedly market under the name Acculink. In addition to a T-1 composite link, the system will support a 56K bit/sec composite link compatible with AT&T's Dataphone Digital Service links.

Asynchronous devices can transmit to the multiplexer node at speeds up to 19.2K bit/sec, while synchronous devices can transmit up to 1.31M bit/sec. Using adaptive differential pulse code modulation (ADPCM), the unit will squeeze the equivalent of two T-1 lines onto one.

Supplied with an integral digital data service customer service unit (CSU), the multiplexer node supports two T-1 DS1 or V.35 interfaces, while the switching node will support up to 16 DS1 interfaces. The integral CSU includes an option to provide power to the T-1 span.

Incoming data channels are linked to the multiplexing node through four-port channel modules, which come with RS-232-C, RS-422/423, CCITT V.24, CCITT V.35 and Military Standard 188-114 interfaces. Private branch exchange and other telephone equipment links directly to the multiplexer node over four-port modules supporting two- and four-wire interfaces.

Using pulse code modulation, the multiplexer will support voice channels operating at 64K bit/sec. Employing ADPCM, the multiplexer node will accept voice channels operating at 32K bit/sec or 24K bit/sec.

The Crossnet System is reportedly compatible with Tellabs' central telephone office-resident DACS switches, which are capable of switching up to 256 T-1 links. It is also compatible with Tellabs' statistical multiplexers, packet switches and voice frequency signaling units.

See **Crossnet** page 25

Products & Services

Packages link VAX to IBM

Systems Strategies, Inc. announced a line of communications packages that connect Digital Equipment Corp. VAX minicomputers and MicroVAX systems to IBM mainframes.

The **VAX-Link** series of packages — which are downloaded from an IBM system into the random-access memory of DEC's communications processor boards — allows VAXes and MicroVAXes running Ultrix, Unix or VMS operating systems to access networks using IBM's Systems Network Architecture and Binary Synchronous Communications protocols.

The series also allows the VAX or MicroVAX to exchange information over X.25 packet-switched networks.

VAX-Link/SNA 3270 and **VAX-Link/BSC 3270** emulate 3270 devices, including the 3287 printer and 3278 or 3279 terminals. The packages include an Application Program Interface for building applications that allow a VAX system to interact with an IBM mainframe without a terminal operator.

VAX-Link/SNA RJE emulates IBM's Synchronous Data Link Control 3770 Remote Job Entry (RJE) workstations, allowing DEC VAXes to submit batch processing jobs to an IBM mainframe. **VAX-Link/BSC RJE** emulates IBM's Binary Synchronous Communications protocol-based 2780, 3780 and HASP RJE workstations.

VAX-Link/X.25 interfaces the VAX to an X.25 packet-switched data network. The product meets the 1984 Consultative Committee on International Telephony and Telegraphy recommendations and has been certified by Telenet Communications Corp.

VAX-Link offerings also includes a **VAX-Link/LU 6.2,** which connects the VAX to IBM's DISOSS. A **VAX-Link/DIA** package allows VAX systems to access IBM's document distribution and library services. **VAX-Link/DCA** converts DISOSS-compatible Document Content Architecture documents into VAX documents, while the **VAX-Link/SNADS** package allows document distribution between DEC and IBM office network components.

The VAX-Link packages range in price from $3,500 to $10,000, depending on the hardware configuration being used.

Systems Strategies, Inc., 225 W. 34th St., New York, N.Y. 10001 (212) 279-8400.

COMMUNICATION NETWORKS '87

Conference sessions now available on audio and video cassettes.

You can choose from more than 80 audio taped and 10 video taped CN'87 conference sessions. Timely topics are presented by the leading authorities in telecommunications — Dixon Doll, John McQuillan, Harry Newton and Howard Frank.

To receive prices and a complete listing of available cassettes simply fill out the coupon and mail it to: CN '87 Tape Center, Communication Networks, P.O. Box 9171, Framingham, MA 01701-9171.

Yes, I'm interested in receiving information on Communication Networks '87 audio/video tapes.

Name: ____________________
Title: ____________________
Company: ____________________
Address: ____________________
City/State/Zip: ____________________
Telephone: (   ) ____________________

NW

Package offers redundant POS links

Innovative Electronics, Inc. released a local-area network version of its retail point-of-sale (POS) system, the **Netmaster In-Store Processor (ISP).**

The personal computer-based Netmaster ISP links NCR Corp. POS terminals to an IBM host using Systems Network Architecture protocols. With the networking option, additional personal computers can be linked together to provide additional host access and redundant in-store application processing. The network version keeps a redundant copy of each day's in-store transaction data base and price list data base.

The network version is priced at between $800 and $1,500.

Innovative Electronics, Inc., 4714 NW 165th St., Miami, Fla. 33014 (305) 624-1644.

Board links PC to DEC VAX

Xyplex, Inc. introduced a personal computer add-on board that connects IBM Personal Computers to its front-end processor board residing in Digital Equipment Corp. VAX minicomputers.

The **PC Xpander** board and software allows personal computers to connect to VAX applications, files and peripherals. It allows a VAX terminal user to control the execution of personal computer applications. With the board and software, the personal computer is linked to the Xyplex System, which connects multiple devices to the VAX. The Xyplex System reportedly offloads network processing tasks from the VAX, thus freeing up application processing power.

Packaged in three modules, the software resides both on the VAX and the personal computer. The software takes up 80K bytes of random-access memory on the personal computer.

A VAX-to-personal computer module enables the VAX to download data directly to MS-DOS applications, such as Lotus Development Corp.'s 1-2-3. A personal computer-to-VAX module allows such VAX applications as VAXmail to run on the personal computer and also allows the VAX to store duplicate copies of personal computer files.

The add-on board is $695, while the software lists for $375.

Xyplex, Inc., 100 Domino Drive, Concord, Mass., 01742 (617) 371-1400.

Kit makes Deskpro 386 into file server

ACS Telecom released a disk expansion kit designed to give network file server capabilities to Compaq Computer Corp.'s Deskpro 386 Personal Computer.

The **10-Disk/386 Expansion Kit** adds up to 630M bytes of hard disk storage to the Intel Corp. 80386 microprocessor-based Deskpro 386. The Deskpro 386 comes with 40M bytes, 70M bytes or 130M bytes of storage. According to ACS Telecom, the disk expansion kit is compatible with local-area network systems, including its own 10-CAD, Fox Research, Inc.'s 10-Net, 3Com Corp.'s Ethernet-compatible local nets, IBM's Token-Ring Network and Datapoint Corp.'s ARCnet.

The kit's price starts at $5,595.

ACS Telecom, 25825 Eshelman Ave., Lomita, Calif. 90717 (213) 325-3055.

Package links Macintosh to DEC VAX

White Pine Software, Inc. released a line of packages that link Apple Macintosh personal computers to Digital Equipment Corp. VAX minicomputers.

VMacS allows Macintosh users to store and manage Macintosh files on the VAX. The Macintosh-to-VAX link is made with a Macintosh-resident communications package such as the **Mac240.** Converting Macintosh graphics for use on the VAX is the function of the **Reggie** package.

The VAX-resident VMacS allows Macintosh users to store Macintosh text, data and application files on the VAX and to share them with other Macintosh users without a direct user-to-user connection.

VMacS can be used with terminal emulation packages since it supports the XMODEM MacBinary file transfer protocol and data file format conversion. With VMacS, files stored on Macintosh hard disks can automatically be backed up to the VAX as part of VAX system maintenance.

The Mac240 Version 1.3 communications package runs on the Macintosh and gives users three communications options. It provides Macintosh users with access to VMacS and other VAX applications, and supports Macintosh-to-Macintosh communications.

With the package, a Macintosh can emulate DEC's VT240 text and graphics terminal, Tektronix, Inc.'s 4010 and 4014 graphics terminals or DEC's VT100, VT220 and VT52 text terminals.

The package also supports transfer of graphics files from the VAX to the Macintosh.

The package allows Macintosh graphics to be stored on the VAX, displayed on VAX-connected graphics terminals and printed on VAX-connected laser printers. The package also allows DEC VT241 or VT125 terminals to add color to converted Macintosh graphics.

A single user license for VMacS costs $399, and the multiuser license is $999. Mac240 Version 1.3 costs $4,199, and Reggie costs $99.

White Pine Software, Inc., P.O. Box 1108, Amherst, N.H. 03031 (603) 673-8151.

Device from **page 23**

The device will also support IBM Systems Network Architecture/Synchronous Data Link Control communications and asynchronous protocols.

Traditionally a supplier of packet-switching equipment to Bell operating companies, Siemens hopes the product will help the company break into Fortune 500 corporate accounts that have an eye toward private networking.

"We're beginning to focus now on the corporate user marketplace. It's a natural adjunct to our BOC sales," said Hank Segal, assistant vice-president of marketing for Siemens Data Switching Systems.

Siemens Data Switching Systems, formerly Databit, Inc., conceived its corporate marketing scheme last October, concurrent with the company's name change. Siemens actually purchased Databit in 1979, 10 years after Databit was founded.

Since then, however, only two packet-switching systems have been sold to end-user accounts. Both were purchased by Boeing Co. plants in Pennsylvania. Segal also said Siemens Data Switching Systems has bid on a number of other potential end-user accounts.

The recently announced ANP 1220 features a single X.25 trunk access port and three device access ports, which support connection of terminals and communications controllers to the unit. The firm plans to expand the unit to support four additional device access ports connecting to the single X.25 link.

Acting as a packet assembler/disassembler as well as a multiplexer, the ANP 1220 generates packet lengths of 128 bytes or 256 bytes. It accepts data at speeds up to 19.2K bit/sec and transmits data over the X.25 link at speeds up to 56K bit/sec. The unit will support RS-232-C, V.24/V.28 and V.35/X.1 interfaces.

Although limited to three device access ports, the ANP 1220 will support 32 virtual circuits in an interactive BSC environment, 24 virtual circuits in an SNA/SDLC environment and four virtual circuits in a BSC RJE environment.

ANP 1220 communications software resides in interchangeable Protopac 2 modules.

Network parameters, call numbers and buffer allocation control functions are stored in nonvolatile memory and can be configured on a per-port basis.

The ANP 1220 will also directly interface to a front-end processor that runs IBM's Network Control Program Packet Switching Interface or to another ANP 1220 acting as a host PAD.

Depending on configuration, the ANP 1220 costs about $5,000 and is available from Siemens Data Switching Systems, Inc., 110 Ricefield Lane, Hauppauge, N.Y. 11788 (516) 435-4000.

Siemens Transmission Systems, Inc. also recently released its MLS 45 MX3 digital multiplexer, which multiplexes up to 28 DS1 or equivalent DS1C or DS2 signals onto a single 45M bit/sec DS3 line. The device interfaces the multiple T-1 lines into high-capacity fiber-optic or digital microwave transmission systems.

Primarily aimed at the telephone company central office market, the MLS MX3 includes a maintenance processor unit that controls system maintenance, administration, alarm conditions and diagnostics. An optional rack-mountable CRT-based Maintenance Shelf that controls up to 26 MLS 45 MX3 multiplexers consists of a printed wiring card with space for a CRT screen, keyboard and modem.

A fully equipped MLS 45 MX3 multiplexer listing for $8,400 is available from Siemens Transmission Systems, Inc., 2411 W. 14th St., Tempe, Ariz. 85281 (602) 921-5800. ☐

Crossnet from **page 23**

System configuration and administration is performed from a centrally located personal computer attached to an administration port on the Crossnet System. The interactive menu-driven software allows administrators to define channel, system and network parameters from the personal computer.

That information is stored in nonvolatile memory and can be downloaded to remote Crossnet multiplexing and switching nodes. The software will also collect diagnostic information from Crossnet System nodes.

Optional modules supporting redundant power supply, system logic, T-1 synchronous clocking, system clocking and switching matrix will sense primary module malfunctions and automatically switch to backup operation.

A nonredundant multiplexing node with a T-1 interface, integral CSU and 12 voice or data channels lists for $14,150. A redundant 128-channel version costs $91,200. A nonredundant, integral CSU-equipped switching node capable of switching four T-1 lines is priced at $14,200, and a redundant version supporting the full 16 T-1 lines costs $39,250.

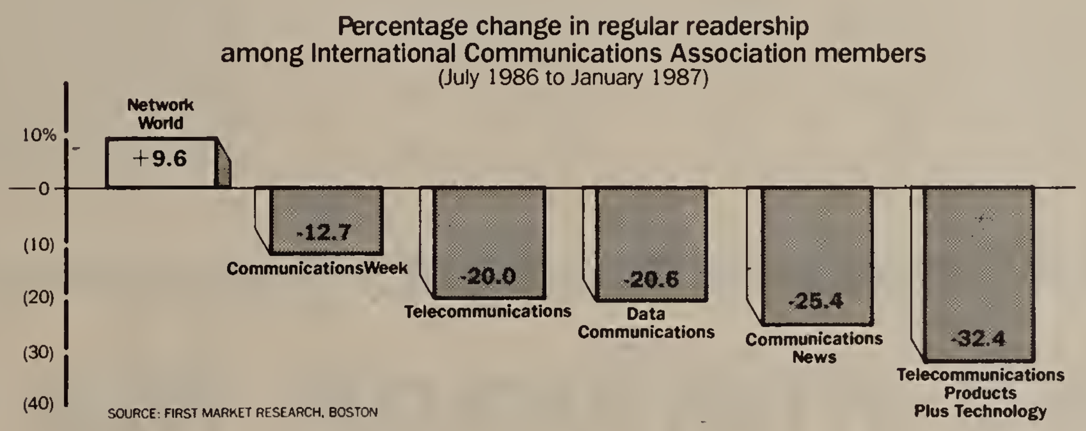
Tellabs, Inc. is located at 4951 Indiana Ave., Lisle, Ill. 60532 (312) 969-8000. ☐

NETWORK WORLD
375 Cochituate Road, Box 9171/Framingham, MA 01701-9171/(617) 879-0700

February 23, 1987

Thanks for making us No. 1 in readership growth.

Thanks for making us the only publication growing in readership.



SOURCE: FIRST MARKET RESEARCH, BOSTON

Dear ICA member,

It took you only 10 short months to endorse the concept of networking over the passing notion of plain old communications.

For most of you, networking means much more than just computers and communications. Networking is a business strategy. The goal: to link people and information for bottom-line benefits.

The shift to networking shows in your reading habits. In less than a year, you have embraced *Network World* in such large numbers that all our competitors are actually losing readers.

It's not that they haven't tried to imitate us. Our competitors are often our biggest followers. While imitation may be the sincerest form of flattery, no other publication matches the depth or scope of *Network World*'s networking coverage.

Thanks for giving us readership leadership. Thanks for making us No. 1.

Sincerely,
Bruce Hoard
Bruce Hoard
Editor

IMPLEMENTATION

WALTER ULRICH

Love thy user as thyself

As specialists in technology operations, communications managers are responsible for evaluating the technical merits of new networks and systems. Today's communications environment is more complex than ever, combining both information systems and office automation. For this reason, the implementation of a new system doesn't take place in the back room anymore; it happens right in the user's office.

The implementation planning cycle begins when a new system is first considered and ends only when every last employee is a proficient user of that system. Following these 10 commandments can help users avoid the pitfalls along the way:

1. Thou shalt plan to train, train effectively and train forever. New systems cannot be learned through osmosis. Users must be weaned from their old methods and onto new ones. And even after the system is implemented, new employees must be trained.

2. Thou shalt start with specialized user communities and seek out applications. New systems should be implemented in stages. Start with the communities that will benefit the most from the new technology. Identify applications that will promote use of the system. Start with users who are most likely to embrace the technology. They will become the disciples who will carry the word to the more resistant users.

3. Thou shalt provide for individual differences. People learn about and use technology differently. The system and the implementation program must allow for this.

4. Thou shalt not require users to have Ph.D.s in network linguistics. Users must be able to use the system without learning specialized jargon.

5. Thou shalt not require users to be athletes in keypad manipulation. Communications systems that demand great manual dexterity to punch in complicated sequences on push-button pads are doomed to failure.

6. Thou shalt provide support. Classroom training is necessary for all but the simplest modifications to existing systems. Classroom instruction should often be supplemented by one-on-one coaching. A help desk — an assistance group provided by the user organization — should be available to answer questions over the telephone. New technology should be taught to the information center staff members so they can assist users with problems and questions.

7. Thou shalt not foment continuous technology change. Users should not have to deal with constant modifications in the network or in its many systems. Change is confusing and reduces productivity. Releases of new technologies within an organization should occur at well-spaced intervals to allow easy absorption by the user community.

8. Thou shalt listen to thy users for they are both the beneficiaries and the victims of thy good works. Users know far more about their support environments than the technologists who developed them.

9. Thou shalt be flexible and evolve thy technology according to the users' needs. And above all, thou shalt be guided by a written plan. Communications technology should fit into a corporate technology plan, and the corporate technology plan should fit into the corporate strategic plan.

10. Thou shalt work toward the betterment of thy company and of humankind through technology. Communications networks and new systems are not ends in themselves. Their purpose is to advance the objectives of the organization through its workers. In the past, technology has complicated the jobs of the people who used it. The system should better the lot of the employees who rely on it.

Managers should always remember the Golden Rule: Do unto others as you would have them do unto you. When making decisions about advanced technology, managers should put themselves in the place of their users. Will the new technology make their jobs easier? Does the implementation plan provide for a smooth transition that minimizes chaos and speeds the benefit of the new technology?

Organizations are becoming more and more dependent on information and communications technology. Communications professionals have an obligation to consider the end users in technology planning.

Installing a network is not the end of a project, but the beginning of one. Technology implementation requires more knowledge, more sensitivity and more foresight than technology selection. Implementation planning is the key.

Ulrich, a partner in Coopers & Lybrand, manages the firm's Walter Ulrich Consulting subsidiary in Houston. This column is based on a keynote address that Ulrich will be giving at the Association of Information Systems Professionals seminar on March 11.

MARKET MANEUVERS

BRIAN JEFFERY

Don't misjudge Ma Bell

Can AT&T make it back from recent hard times? Against a background of massive layoffs, the admitted failure of its Computer Systems Division and a $3.2 billion fourth-quarter pretax charge, it might seem reckless to be bullish about AT&T. Yet, amid its troubles, AT&T has shown a surprising degree of strength. Its financials are not good, but in view of the company's problems, it could be a lot worse.

Overstaffing, duplication and inefficiencies in marketing, manufacturing, research and development, and administration have clearly dragged down financial performance, and it's likely that the less tangible uncertainties of organizational and management changes have also added to the problem. By removing some of these factors — and AT&T's management has made it clear that they plan to do so — the company is going to be leaner, more efficient and profitable. A few years down the line, AT&T could easily be one of the more cost-effective performers in the computer and communications sector.

AT&T's new direction, while widely viewed as a "back to basics" retreat, does not represent any major disengagements. In turning over responsibility for low-end systems to Ing. C. Olivetti & Co., S.p.A., the company has brought into play an organization that's considerably better qualified than AT&T's Computer Systems Division. Olivetti ranked as the world's 12th largest computer firm in 1986, and its performance in European markets has demonstrated a strength and savvy that far exceeds that of the Computer Systems Division.

Similarly, AT&T's focus on data networking for its mid-range systems appears eminently sensible. In the wake of divestiture, there has been a large-scale movement by corporate end users to bring voice and data communications networks in-house.

AT&T's product lines and embedded capabilities are far better equipped to deal with this type of networking application than with the stand-alone minicomputer market.

AT&T's shift also puts the company in a better looking, higher growth market. The departmental systems market was always about networking (witness Digital Equipment Corp.'s success with DECnet) and not stand-alone systems, although some vendors and consultants seem to have been under this misapprehension for a while. AT&T's move is sensible and is designed to address a major opportunity. Still, it is viewed in the industry as a withdrawal.

AT&T's basic telecommunications businesses are also ripe for a turnaround. After several years of inroads from bypass competitors, the company is moving aggressively to add fiber-optic cable, upgrade plant and equipment (at a cost of $8.5 billion over three years) and reduce some of the remaining regulatory constraints on pricing and marketing. Service revenue showed growth during 1986, while equipment revenue was generally weak.

Also, the company's recent em-

Jeffery is managing director at the International Technology Group, a Palo Alto, Calif.-based research and consulting firm specializing in the IBM market.

Tell it as you see it. *Network World* is soliciting guest-penned columns for its opinions pages. Manuscripts must be letter-quality, double-spaced and approximately 600 to 750 words in length. Disk and modem submissions are preferred.

Columns should be timely, controversial, literate and technically accurate.

Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 584.

▶ TELETOONS — By Phil Frank

HOW TO AVOID MANAGEMENT BY CRISIS
Phil Frank

phasis on Integrated Systems Digital Network indicates that the carrier is going after an area with major long-term opportunity.

ISDN was always AT&T's ace in the hole. It's a technology that could integrate the conventional telecommunications and data processing worlds in a manner that favors telecommunications businesses. While even the Consultative Committee on International Telephony and Telegraphy estimates that large-scale ISDN services will not arrive for 10 to 20 years, AT&T could accelerate this process.

And from the way things are shaping up, it looks like AT&T plans to do precisely that.

Perhaps the best indicator for AT&T's future performance is its current management team. It may be conservative and telecommunications-oriented, but it's also not afraid to bite the bullet. The large staff layoffs and the company's willingness to take hits on the order of last year's $3.2 billion fourth-quarter charge, while laying out billions on new plants and equipment, suggests that AT&T's management is moving aggressively. It's one of life's more curious ironies that a massive corporate recovery exercise is regarded as less glamorous and less noteworthy than a high-rolling success.

AT&T's painstaking and painful turnaround contrasts sharply with the disarray of IBM. Big Blue has gyrated frantically since its financial slide began in 1984. It seems not to recognize it has fundamental problems that cannot be resolved by another quarterly sales push, financial maneuver or staff reshuffling. It's also worth contrasting the unglamorous way in which AT&T is pursuing its goals (and getting poor coverage) with the flashy and shortsighted IBM growth strategy of the early 1980s (which raised the company to the status of a veritable American hero). Certainly, if realism and a willingness to face problems squarely are criteria for good management, right now AT&T is a better managed company than IBM.

The battle of these two giants, albeit with DEC in the field as a third player, may take place in a few years after all. And it is not so clear today that IBM will be the winner. ◘

INTEROPERABILITY

JEFF HORN

The pillage of OSI

The edifice of international standards protocols is nearing completion and everyone is rushing to get a piece of the action. But that's all they're getting.

Users and vendors alike are hauling away pieces of the seven-layer Open Systems Interconnect monolith and plugging them into their networks wherever they fit, wherever they provide a quick fix, or wherever it sounds good to be using OSI. The OSI model and its corresponding suite of protocols were designed to provide universal interoperability, but that lofty goal will never be achieved by short-term upgrades and piecemeal implementations. Users and vendors need a long-term strategy that incorporates all of the OSI model.

One popular but misleading way to implement a subset of the OSI protocols is to install Ethernet, which is specified by the IEEE 802.3 standard. Vendors subscribing to this method claim OSI compatibility because their Ethernet boards conform to 802.3.

However, 802.3 only provides data-link level support between adjacent nodes on a network, while the higher layers are still provided by proprietary protocols.

Some users run DECnet over Ethernet, and some vendors offer Xerox Network Systems protocols over Ethernet. Products are being introduced that can communicate using either XNS or DECnet protocols over Ethernet. But DECnet protocols are incompatible with XNS protocols. Yet vendors are saying that their networks use OSI protocols to run DECnet and XNS simultaneously, or that their computers can communicate via DECnet and XNS protocols. But can an XNS user on that computer or that network communicate with a DECnet user? No.

The same game is being played in the higher layers of OSI. Look at what happened to a de facto national standard, the Department of Defense protocol suite. The full Defense Department protocol suite provides functionality that is roughly equivalent to the OSI model's seven layers, but some vendors are choosing not to implement its higher layer protocols such as Telnet (terminal emulation), simple mail transfer protocol (SMTP) for electronic mail, and the file transfer protocol (FTP). Instead, these vendors are implementing proprietary protocols to run on top of the Department of Defense's transport layer and network layer protocol, Transmission Control Protocol/Internet Protocol.

For example, Network Basic I/O System interfaces have been built on top of TCP/IP so that NETBIOS applications can run over TCP/IP networks. Some of these applications implement their own forms of terminal emulation, electronic mail and file transfer. But these applications can't talk to the Telnet, SMTP and FTP applications running on the same TCP/IP network. It's no longer enough to say that a product implements TCP/IP. The user must also ask what runs on top of TCP/IP in that product.

What will stop the same thing from happening to the OSI protocols? Nothing.

We already have proprietary network protocols running over X.25, 802.3, 802.4 and 802.5. How long before vendors offer NETBIOS interfaces on top of TCP/IP? One vendor is even bringing to market an implementation of the X.400 messaging protocols over its own lower-layer networking protocols. Will we see vendors implementing the other emerging OSI application-layer protocols, such as Virtual Terminal, FTAM and JTAM, over their proprietary networks? Probably.

What makes the proliferation of mix and match network architectures possible is the modularity of the OSI model's layering scheme. By separating the functions necessary for networking into independent layers, the corresponding protocols end up being interchangeable with other protocols.

Vendors and users are tempted to break with the OSI model at the data link, transport and application layers. The term "protocol stack" is being used increasingly to describe a single combination of protocols for all seven layers but from different protocol suites, such as Department of Defense, OSI or DECnet. But an end node that imple-

See **Pillage** page 34

Horn is a consultant at Network Strategies, Inc., a communications consulting firm in Fairfax, Va.

NETWORK WORLD

Features

March 2, 1987

ILLUSTRATION BY MATTHEW PIPPIN © 1987

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

Qualification Form for Free Subscriptions.

Please answer **ALL QUESTIONS,** sign and date the card.

Free subscriptions will be accepted only from individuals in the U.S. and Canada with active professional or managerial responsibilities in communications. The publisher reserves the right to limit the number of free subscriptions accepted in any business category. To qualify, you must answer all the questions below completely, **sign and date this form.**

If address has changed, attach mailing label with old address here.

☐ Address Change ☐ New subscription

First Name | Middle Initial | Last Name

Your Title

Company Name

Div Dept

Street Address

City | State | Zip Code

Is the above your home address? ☐ Yes ☐ No

I wish to receive a subscription to *Network World*: ☐ **Yes** ☐ **No**

Signature ______________________________

Title ______________________ Date __________

Business Phone (__________) ______________________

PLEASE ANSWER ALL QUESTIONS, SIGN AND DATE THE CARD.

1 My primary areas of activity. (Circle ONE only)

I am involved in evaluating communications (data, voice and/or image) products and services:

1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) ______________________

1a For communications, my primary responsibility is: (Circle ONE only)

1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) ______________________

2 Circle only the ONE title classification which most applies to you.

Company Management

11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications

21. Management
    VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff:
    Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications

31. Management
    VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications

41. Management
42. Supervisory/Staff

MIS/Data Processing

51. Management
    VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications

Others

75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other ______________________

3 Job Function

Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)

Corporate

1. Business Management, Planning and/or Development

Communications System/Network

2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other ______________________

4 Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)

Consultants

11. DP/Communications Consulting Services
12. Consulting Services (except DP/ Communications)

End Users

13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors

41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other ______________________

5 In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)

1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 Check ALL that apply in columns A and B.

A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:

B. These products and services are presently in use at this location:

A B Product/Services

Computers

01. ☐ ☐ Micros
02. ☐ ☐ Minis
03. ☐ ☐ Mainframes
34. ☐ ☐ Printers

Data Communications

04. ☐ ☐ Communications Processors
05. ☐ ☐ Comm./Networks Software
06. ☐ ☐ Digital Switching Equipment
07. ☐ ☐ Facsimile
08. ☐ ☐ Modems
09. ☐ ☐ Multiplexers
10. ☐ ☐ Protocol Converters
11. ☐ ☐ Network Mgmt. & Control
12. ☐ ☐ Test Equipment
13. ☐ ☐ 3270 Controllers
35. ☐ ☐ Intelligent Terminals

Telecommunications

14. ☐ ☐ PBXs
15. ☐ ☐ Key Systems
16. ☐ ☐ Central Office Equipment
17. ☐ ☐ Integrated Voice/Data Terminals

A B Product/Services

Transmission/Network Services Equipment

18. ☐ ☐ Microwave
19. ☐ ☐ Satellite Earth Stations
20. ☐ ☐ Local Area Networks
21. ☐ ☐ Wide Area Networks
22. ☐ ☐ Packet Switching Equipment
23. ☐ ☐ Fiber Optic Equipment
36. ☐ ☐ T1

Communications Services

24. ☐ ☐ Packet Switching Services
25. ☐ ☐ Cellular Mobile Radio Services
26. ☐ ☐ Electronic Mail
27. ☐ ☐ Enhanced Services
28. ☐ ☐ Centrex
29. ☐ ☐ Long Haul Services
30. ☐ ☐ BOC Services
31. ☐ ☐ Independent Telco Services

Other

32. ☐ ☐ Factory Communications
33. ☐ ☐ Online Data Bases

7 Estimated value of communications systems, equipment and services:

A. which you helped specify, recommend or approve in *last* 12 months? (Check only ONE in column A.)

B. which you plan to specify,recommend or approve in *next* 12 months? (Check only ONE in column B.)

A B

1. ☐ ☐ $10 million and over
2. ☐ ☐ $5 million - $9.9 million
3. ☐ ☐ $1 million - $4.9 million
4. ☐ ☐ $500,000 - $999,999
5. ☐ ☐ $250,000 - $499,999

A B

6. ☐ ☐ $100,000 - $249,999
7. ☐ ☐ $50,000 - $99,999
8. ☐ ☐ Under $50,000
9. ☐ ☐ Don't Know

8 Estimated gross annual revenues for your entire company/institution: (Circle ONE only)

1. Over $1 billion
2. $500 million to $1 billion
3. $100 million to $499.9 million
4. $50 million to $99.9 million
5. $10 million to $49.9 million
6. $5 million to $9.9 million
7. under $5 million

9 Estimated number of total employees at this location: (Circle ONE only)

1. Over 5,000
2. 1,000 - 4,999
3. 500 - 999
4. 250 - 499
5. 100 - 249
6. 50 - 99
7. 20 - 49
8. 1 - 19

3A06-86

NETWORK WORLD
THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES
P.O. BOX 1021
SOUTHEASTERN, PA 19398-9979

PLACE
POSTAGE
STAMP
HERE

▲
FOLD HERE AND MAIL TODAY

STOP. Did you do the following:

1. Supply old and new address if address has changed
2. Answer all questions
3. Sign and date form

Enclosed is my:
- ☐ Address change.
- ☐ New subscription request.

THANK YOU.

NETWORK WORLD
THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

PLEASE TAPE HERE
▲

Uncle Sam goes shopping

FTS spells Full-Time Service for the vendor that takes on the federal contract.

Continued from page 1

than 1,700 government locations throughout the U.S., Puerto Rico and the U.S. Virgin Islands.

But the current system, which is more than 20 years old, is becoming more outmoded every day. Because it is analog, FTS cannot take advantage of recent breakthroughs in digital technology and can't provide many advanced services, such as high-speed data, packet switching, video transmission, and integrated voice and data. According to one U.S. Department of Energy user who asked not to be named, "We are unable to transmit data above 1,200 bit/sec through FTS. Whenever we need to transmit data, we use one of the commercial long-distance carriers."

Andrade is senior staff consultant for Telesynetics Corp. in Fairfax, Va., a telecommunications consultant firm, and NeSmith is group manager at Network Strategies, Inc., a communications consulting firm in Fairfax, Va.

But beyond the technological deficiencies, GSA has been stung by price increases for communications services. Therefore, the agency says its primary objective is to decrease and stabilize those costs. Thus was born FTS 2000.

The birth of FTS 2000

In early 1985, the GSA developed the idea for FTS 2000. In September, the first draft of the request for proposal was ready. Communications users supported the procurement strategy, but vendors raised concerns that the government did not share their financial risk in the venture. Vendors also pointed out that the government was asking for services that were not yet available, such as local-area network interconnectivity, Integrated Services Digital Network and networkwide voice features such as call forwarding.

A second draft of the RFP was released in October 1986 to address vendors' concerns and to outline time frames for implementing new technologies.

The final draft, which is approximately 400 pages long, was released Jan. 5. According to Walter Irvine, GSA project director for FTS 2000, "Some changes were made to clearly differentiate between equipment capabilities and network capabilities, such as 9.6K bit/sec data switching, 19.2K bit/sec data switching and switched voice features. Every industry comment was addressed, and every change was justified for technical and economic reasons."

The GSA has the distinction of offering the largest communications contract ever. A ceiling of $26 billion over the next 10 years was placed on the procurement, Irving said, "to ensure that the needs of government agencies are satisfied." By the time the first

☞ Continued on **page 30**

From **page 29**

draft was out, vendors started lining up. To date, the following teams have been formed:

- AT&T and Boeing Computer Services;
- Electronic Data Systems Corp. (EDS) and US Sprint Communications Co.;
- Martin Marietta Corp., Northern Telecom, Inc., MCI Communications Corp. and the regional Bell holding companies.

Martin Marietta and EDS are two vendors that could become forces to be reckoned with if they win the FTS 2000 contract. And although most vendors have a lot to gain, AT&T has a lot to lose. AT&T is the incumbent bidder and stands to forfeit a significant amount of revenue if another bidder is awarded the contract. Speculation about other potential bidders includes bidding by a fiber-optic consortium teamed up with a group of equipment vendors. The deadline for responses is December 1987.

How it's put together

The RFP includes the standard government sections on solicitation, packaging and marking, inspection and acceptance, deliverables, contract administration data, special contract requirements, service contract clauses, attachments, representations, instructions and evaluation factors. Two additional sections form the heart of the RFP: One defines pricing, and the other encompasses description/specification/work statement.

These two sections contain the specifications necessary to satisfy the following GSA objectives as stated in the RFP:

- To obtain a comprehensive set of telecommunications services.
- To obtain telecommunications services through a prime service contractor responsible for providing all services and network management.
- To forecast telecommunications costs accurately over a 10-year contract period.
- To meet government requirements for national security and emergency preparedness.
- To adopt an architecture that will provide a smooth migration to an ISDN environment.

The GSA has divided network services into six categories: switched voice, switched data, switched digital integrated, packet switched, video transmission and dedicated transmission. Features, functions, capabilities and service locations of these services are split into mandatory and mandatory optional specifications. A mandatory specification is one that the GSA requires, the vendor must provide and that the GSA will procure. A mandatory optional is one that the GSA requires, that the vendor must bid and that the GSA may procure. This is unusual because it is directed toward services rather than hardware and software.

Each of the services is divided into originating access, network and terminating access. Both originating and terminating access segments provide the customer service at the Service Delivery Point (SDP). The network segment connects the originating and terminating access segments. The SDP is designated as the user interface and defines the electrical, mechanical and functional characteristics to which both the user and the FTS 2000 vendor must adhere. The FTS 2000 vendor shall be completely and unconditionally responsible for all aspects of service quality, interconnectivity and interoperability of services between SDPs.

The switched-voice service requirement alone will accomplish what the entire FTS system is actually doing for the government right now. The other five network services are additional capabilities for users.

Switched-voice services include voice channels and modem data channels up to 4.8K bit/sec. These services are similar to those of the old FTS system but with better quality on the access segments and with more features. According to William Schuhl, communications management specialist for the U.S. Department of Commerce, "If FTS 2000 does nothing more than give an accurate reading of call use to our department, it will be worth it."

Martin Marietta and EDS could become forces to be reckoned with if they win the FTS 2000 contract.

Switched data services are user-initiated data transmission at 56K bit/sec and eventually at 64K bit/sec. The two different switch-data services are EIA RS-449 with RS-423 or RS-422 signaling and CCITT V.35. This service could be used for high-speed bulk data transfer, facsimile, compressed video, encrypted voice and network backup.

Switched digital integrated service is the GSA's answer to ISDN because it will eventually provide capability to integrate voice, data, image and video services using end-to-end digital connections. The GSA has specified that the FTS 2000 vendor will provide protocol converters for non-ISDN-compatible terminals such as ASCII terminals. This requirement has tremendous potential to create a de facto ISDN terminal interface standard for the U.S.

The FTS 2000 vendor will also supply limited areas in the U.S. with packet-switching services like those offered by GTE Telenet Communications Corp. and Tymnet/McDonnell Douglas Network Systems, Inc. The SDP is defined at either the CCITT X.25 interface or the packet assembler/disassembler standards X.3, X.28 and X.29. The FTS 2000 vendor will also be responsible for CCITT X.75 interfaces for other packet-switching networks.

In addition to packet-switching services, the FTS 2000 vendor will provide electronic mail capability according to CCITT X.400 standards. This network service must also support interfaces to telex and hard-copy delivery.

Video transmission services may be either compressed or wideband. Wideband video signals are identified as broadcast-only signals that meet commercial network-quality video standards such as EIA RS-250B. The vendor must provide the compression/decompression equipment, and the compressed signal must not exceed 1.54M bit/sec.

In the initial implementation, the GSA does not expect the compression/decompression equipment to adhere to international or national standards. But as standards evolve from the work of organizations such as ANSI and Consultative Committee on International Telephony and Telegraphy Specialist Group 15, the FTS 2000 vendor must conform to them.

Dedicated transmission services for voice, data and T-1 are a requirement for the GSA network. The dedicated voice and data services included in the RFP are similar to many existing tariffed leased services. T-1 is like AT&T's Accunet T1.5 service, with a few exceptions. The FTS 2000 vendor must support Extended Super Frame and Clear Channel Capability, which are migration steps to ISDN. And the T-1 service must have reconfiguration capability at the T-1 or the 64K bit/sec rate.

On-site center oversees service

The FTS 2000 vendor is mandated to establish a customer service office, which shall act as the exclusive contact point. As a part of the customer service office, the FTS 2000 vendor shall operate an office of transition management, a technical advisory center and any other necessary department. The prime service provider will set up a services oversight center, and it will be staffed by GSA personnel who will oversee contract compliance on a daily basis.

Security is a big concern to GSA, as are protection from overload, interoperability, restoration and management during emergencies. The FTS 2000 users, not the FTS vendor, will be responsible for encrypting classified traffic.

The FTS 2000 vendor must propose plans for controlling traffic during emergency situations and for handling two to eight times the engineered normal load. The FTS 2000 vendor must provide some guarantee that at least 10% of the transmission capacity between any two SDPs is for exclusive use by the U.S. government. Also, the vendor is solely responsible during emergency situations.

The first draft of the RFP stated that the vendor must manage the FTS during the transition to FTS 2000. The final RFP has tempered that by requiring the vendor to manage only the FTS 2000 network, with the services oversight center managing FTS during the transition period.

Determining the rates

Pricing for FTS 2000 is divided into two components, the access area and the network element. Pricing for both access areas and the network element is volume-sensitive and measured in six-second increments. The pricing for an average business day may vary according to the time of day or week. The FTS 2000 vendor will provide a matrix of baseline prices between any two access areas. Another table will determine total network-wide traffic volume.

The local exchange carriers could lose or break even, depending on how the contractor provides the last-mile connection. Extensive use of bypass facilities could greatly reduce the amount of revenue the local exchange carriers receive from FTS. If the vendor chooses to build its own transmission facilities, then the local exchange carriers could find themselves out of the loop.

Competition is forcing bidders to drop prices for services. Bernard Bennington, the GSA's deputy commissioner for telecommunications services, says that, "Purchasing leverage used by the government in this case will foster competition among vendors, which may reduce the current cost per call from 40 cents to 20 cents or less. Clearly, the government can do nothing but win."

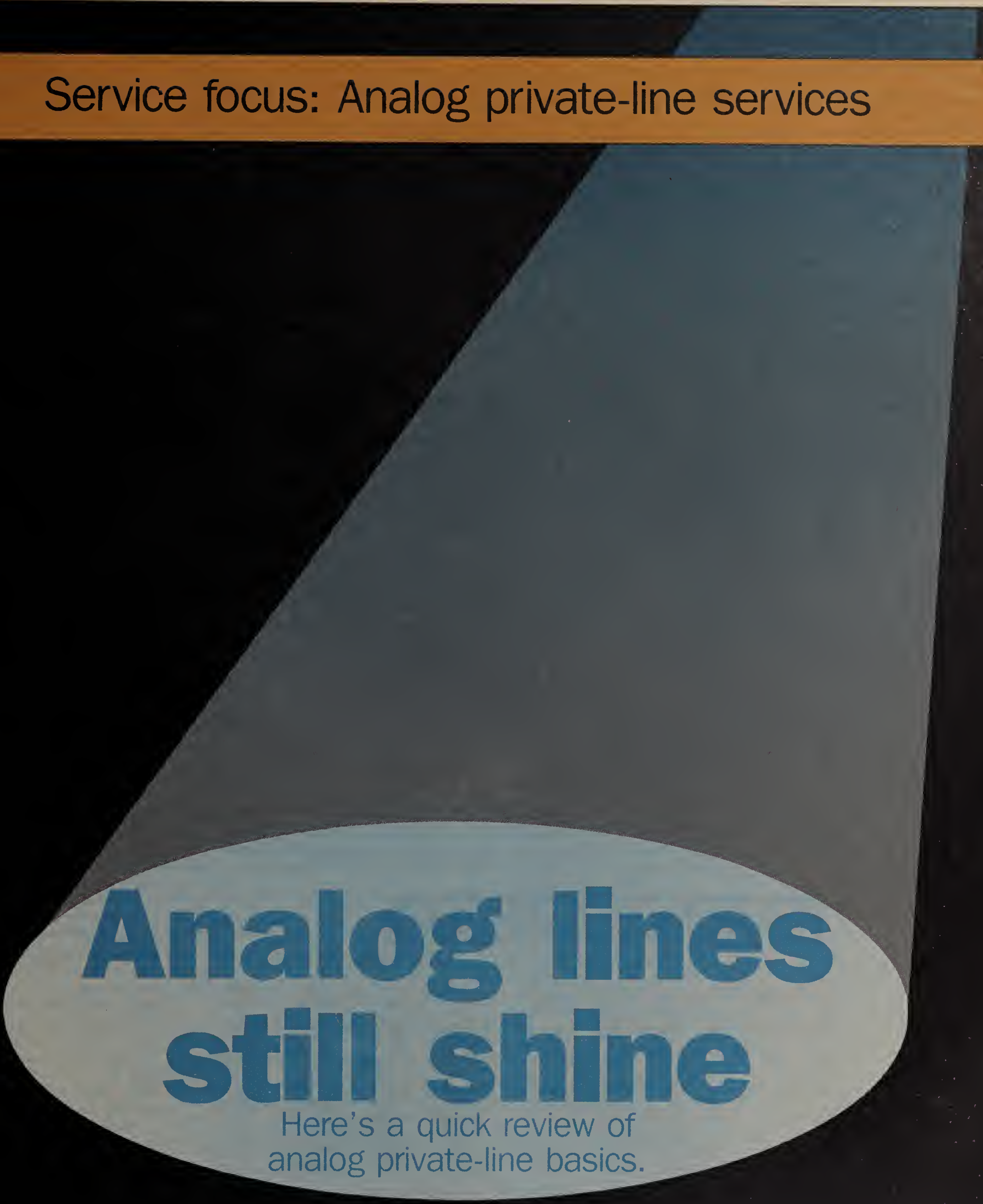
Other players, such as vendors, government employees and other communications users will feel the effects of this procurement because of its emphasis on future technologies. FTS 2000 has the potential to create a new telecommunications carrier, to encourage massive bypass of local exchange carriers and to change the method by which many government users receive communications services.

The standards effort will gain momentum from FTS 2000 because the GSA has emphasized adherence to standards in every element of the network. Standards for ISDN, packet switching, the Open Systems Interconnect (OSI) model, video compression, electronic mail and transmission services such as T-1 were specified in FTS 2000. A procurement of this size will encourage vendors to provide compatible products.

The current FTS network only provides switched-voice services and low-speed data connections using modems. With FTS 2000, most users should get a tremendous number of new services, capabilities and functions at less cost. According to Irving, "FTS 2000 will provide and continue to provide advanced and basic services at a competitive price, because agencies are free to choose a different alternative if they can find a better price or a more advanced service."

Possibly the greatest benefit of all is summarized by Harry Kent, FTS 2000 contracting officer technical representative. "FTS 2000 has great potential to save taxpayers money." And all taxpayers support that. ☐

Service focus: Analog private-line services



Analog lines still shine

Here's a quick review of analog private-line basics.

BY PAUL F. KIRVAN
Special to Network World

All the attention lavished today on shared transmission facilities and Integrated Services Digital Network services is overshadowing a tried-and-true networking alternative — analog private-line services.

Nationwide ISDN service won't be available for at least another five years. Virtual private networks are attracting virtually no customers. Yet, analog lines are still going strong.

Compared to digital private lines, analog private lines are typically 10% to 15% less expensive, provide equal if not better voice transmission quality and support data transmission efficiently up to 9.6K bit/sec.

Dedicated analog private lines are installed for exclusive, 24-hour-a-day access by a specific user and are billed at a fixed monthly rate. They contrast with switched services, such as WATS

☞ See Analog page 32

Kirvan is managing director of Paul F. Kirvan and Associates, a telecommunications and data communications consulting firm in Turnersville, N.J.

Private-line carriers (analog)

American Satellite Co.
1801 Research Blvd.
Rockville, Md. 20850
(301) 251-8333

AT&T Communications, Inc.
Routes 202/206 N.
Bedminster, N.J. 07921
(201) 234-4000

ITT United States Transmission Systems, Inc.
100 Plaza Drive
Secaucus, N.J. 07096
(201) 330-5000

MCI Telecommunications Corp.
1133 19th St. N.W.
Washington, D.C. 20036
(202) 872-1600

RCA American Communications, Inc.
4 Research Way
Princeton, N.J. 08540
(609) 987-4000

US Sprint Communications Co.
Box 11313
Kansas City, Mo. 64112
(800) 527-6972

Western Union Telegraph Co.
One Lake St.
Upper Saddle River, N.J. 07458
(201) 825-5000

Analog from **page 31**

or software-defined networks (SDN), which are available on a shared basis to either individual or multiple customers and are billed at usage-sensitive rates.

Interstate common carriers that offer analog private lines include AT&T Communications, Inc., American Satellite Co., ITT United States Transmission Systems, Inc., MCI Telecommunications Corp., RCA American Communications, Inc., US Sprint Communications Co. and Western Union Telegraph Co. (see accompanying comparative rate chart).

These carriers also offer digital private-line services, as do other carriers such as the National Telecommunications Network. Digital data services will be examined in a forthcoming *Network World* service focus.

Analog circuit types

Low-speed analog circuits — often referred to as Series 1000 channels — typically transmit data pulses generated by remote metering, or telemetry, devices and other machines at speeds ranging from 50 bit/sec to 300 bit/sec. Voice calls are not carried.

Series 2000 circuits are intended for voice-only applications. Series 3000 circuits support data transmission but usually require conditioning to make them less subject to line interference and consequent data errors.

Channel conditioning is used on data-only or alternate voice-data analog circuits and is charged on a flat rate that usually represents 1% to 10% of the basic circuit charge. Conditioning is accomplished through special filtering equipment, located in central offices, that compensates for envelope delay distortion due to analog signal propagation delays.

Wideband service, often referred to as Series 8000, combines groups of lower speed analog channels into one circuit that is optimized for higher speed data transmission through conditioning and other techniques.

Data transmission speeds of 19.2K, 40.8K, 50K and 56K bit/sec are available. These services are cost-effective alternatives to fully digital private lines and are often used as backup channels to digital circuits.

Private lines include two primary components: the Inter-Office Channel (IOC) and the Local Channel. The IOC connects carrier points of presence (POP), which are central offices that provide interstate services.

The local channel connects the POP with intralocal access and transport area central offices for the final link with end users.

From end to end, a complete analog circuit may make use of several physical media, including copper wire, fiber-optic cable, microwave and satellite facilities. The combination of media actually used is transparent to the user.

Carrier advertisements that claim greatly increased quality of service over fiber-optic IOC trunk circuits conveniently neglect to mention that those benefits are seldom realized by users, because nationwide, roughly 95% of local channel circuits are still copper and approximately 80% of central office switches are still analog.

A complete analog circuit may make use of several physical media including copper wire, fiber-optic cable, microwave and satellite facilities.

Additional private-line circuit components include central office connection, switching access and channel conditioning. The central office connect charge pays for the connection from the local exchange carrier to the interexchange carrier. The switching charge is applied at either or both ends of a circuit to be connected, via a private branch exchange system, to other outgoing facilities.

Configuration of interstate, inter-LATA circuits presents new considerations for network planners. Interstate circuits must be routed through the nearest POP within the LATAs at each end of the circuit. In the past, each circuit could be routed more directly.

For example, suppose a company in New York needs data channels to multiple points in Washington, D.C., Philadelphia and Boston. In the past, a likely configuration would have each circuit routed directly to its destination.

Today's tariffs suggest a different approach, with individual interstate circuits connecting POPs in each city and tail circuits running from the POPs to desired destinations.

Data and voice channels are then multiplexed over facilities connecting POPs and routed to specific devices in each area. This approach requires less expensive long-haul circuits between New York and the destination cities, yet it provides essentially the same level of service.

Basic circuit prices for IOC circuits are calculated based on airline mileage between rate centers, as defined by vertical and horizontal coordinates assigned to those rate centers by the Federal Communications Commission.

Rate centers are central offices that have been designated as locations from which circuit mileages will be calculated for billing.

For IOC circuits and inter-rate center channels, mileage is determined based on the coordinates of the central offices at each end of the circuit. Intrarate center channels are usually tariffed at a fixed monthly rate, regardless of distance.

The most convenient and accurate way to price circuits is to obtain the rates directly from the interexchange carrier. The price includes both IOC and intra-LATA channels. It should also include installation charges.

For those who do not want to wait for carriers to provide pricing but desire to price out their own circuits, tariff information firms such as The Aries Group in Rockville, Md., CCMI/McGraw-Hill in Ramsey, N.J., Economics and Technology, Inc. in Boston and Telecommunications Information Services, Inc. in Springfield, Pa., offer ser-

See **Analog** page 33

Voice-grade private-line end-to-end pricing (Four-wire with signaling)

Monthly rates

From	To	AT&T	American Satellite	ITT USTS	MCI	RCA	US Sprint	Western Union
New York	Washington, D.C.	$619.51	$400	$526.77	$578.52	N/A	$474.76	$620.84
New York	Chicago	843.92	650	759.21	798.78	$725	710.28	869.18
New York	Los Angeles	1,435.28	1,145	1,259.17	1,300.02	1,205	1,168.10	1,380.00
New York	Atlanta	906.52	795	781.21	870.24	815	777.43	894.97
New York	San Francisco	1,472.79	1,145	1,295.47	1,365.51	1,205	1,211.56	1,445.64
Chicago	Los Angeles	1,144.01	920	1,002.21	1,009.75	980	958.30	1,063.11
Chicago	St. Louis, Mo.	641.12	N/A	553.51	584.48	780	575.20	627.90
Chicago	Dallas	857.16	795	740.67	755.27	790	775.37	822.43
Chicago	Atlanta	783.58	670	660.15	732.01	780	703.98	741.58
Chicago	Seattle	1,145.28	920	N/A	1,062.69	995	1,037.86	1,105.73

Nonrecurring charges

From	To	AT&T	American Satellite	ITT USTS	MCI	RCA	US Sprint	Western Union
New York	Washington, D.C.	$1,386.10	$320	$225	$1,210.72	N/A	$220.00	$1,065.82
New York	Chicago	1,517.16	320	225	1,333.78	$467	220.00	1,188.88
New York	Los Angeles	1,371.66	320	225	1,191.02	467	220.00	898.82
New York	Atlanta	1,414.68	320	225	1,238.84	507	220.00	1,093.94
New York	San Francisco	1,371.66	320	225	1,191.02	467	220.00	1,046.12
Chicago	Los Angeles	985.86	320	225	858.26	310	220.00	713.36
Chicago	St. Louis, Mo.	1,076.31	320	225	935.94	310	220.00	791.04
Chicago	Dallas	1,073.92	320	225	938.88	310	220.00	793.98
Chicago	Atlanta	1,028.88	320	225	906.08	350	220.00	761.18
Chicago	Seattle	1,441.94	320	N/A	952.46	310	311.96	807.56

Rates shown are for end-to-end two-point service with carrier-arranged local distribution facilities and carriers' default routing.

Actual rates between any two cities depend upon several factors, including the exchange codes of endpoints, carrier- or customer-specified routing, and whether or not the carrier arranges for local distribution facilities.

Special-access surcharges and inside wiring charges may apply, but are not included.

Rates shown are for the first channel. Some carriers offer lower rates for multiple channels.

Rates shown are effective as of Feb. 20, 1987.

SOURCE: PAUL F. KIRVAN AND ASSOCIATES, TURNERSVILLE, N.J., AND ECONOMICS & TECHNOLOGY, INC., BOSTON

Show me how to go the extra mile for less with NEC America.

☐ I'm in a hurry. Call me.
☐ I have a need coming up in the near future. Send me more information.
☐ Please send me information for my files.

Name ______________________________

Title ______________________________

Company ______________________________

Address ______________________________

City/State/Zip ______________________________

Telephone ______________________________

I am ☐ am not ☐ currently using microwave communications.

FOR IMMEDIATE
INFORMATION,
CALL 703-698-5540

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 7003 FAIRFAX, VA

POSTAGE WILL BE PAID BY ADDRESSEE

NEC America, Inc.
Att.:Radio Marketing
2740 Prosperity Ave.
Fairfax, VA 22031-4385

Analog from **page 32**

vices that provide current rates.

Private-line circuits can be configured for one-way operation or two-way operation. Tie lines connect PBX systems, providing voice and data communications between switches. Foreign exchange lines bring the dial tone from a distant central office to a customer's premises.

This is useful for companies that conduct business in cities that are distant from their headquarters but cannot justify the cost of offices in those cities.

Extensions off premises provide service to a location not in the same physical building where service originates.

Ring-down lines provide basic service between two points and usually have automatic signaling provided as part of the service. This service is heavily used in the brokerage industry.

Multipoint lines connect several locations that communicate frequently. This service is more often used in data applications but can occasionally be used for voice if there is signaling to identify who is calling.

A variation of this service involves simultaneous one-way broadcasting of information to multiple locations, such as an emergency fire reporting system.

While analog private lines are used primarily for voice applications, they are well-suited to low-speed data. In addition, they are normally 5% to 10% less expensive than comparable digital circuits.

While analog private lines are used primarily for voice applications, they are well-suited to low-speed data.

Why use digital circuits then? The primary reasons are the elimination of modems at each end of the circuit and the fact that a digital circuit is not affected by envelope distortion, attenuation or phase jitter.

The level of support provided by carriers for analog and digital circuits can vary in terms of both the quality of transmission and the quality of maintenance service.

Users of digital circuits frequently install analog backup circuits in case of the digital circuit's failure. In some cases, users have replaced digital circuits with analog because analog support was better.

A good rule of thumb is to use analog circuits for lower speed applications (4.8K bit/sec and less). For higher speeds, consider digital first, but make provision for backup in case of digital circuit outage.

When planning private-line circuits, perform a thorough traffic analysis to determine the number and locations of circuits needed. After comparing circuit prices, determine whether the communications systems at each end of the circuit have sufficient circuit boards, memory and user access codes to support it.

Affordable analog circuit test equipment is now available from several vendors.

Then determine whether an additional class of service is needed for the new circuits, whether routing patterns are needed for systems that use alternate call routing and whether support is needed for two-wire or four-wire circuits.

Poor transmission levels can usually be adjusted in the carrier's central office. Noise on the line can be reduced or eliminated with special filtering equipment provided by the carrier, and at no extra cost if a previously satisfactory circuit deteriorates. Equipment on either end of the line sometimes causes problems, resulting in finger pointing between carrier and equipment vendor.

Sometimes the entire circuit has to be reinstalled because of defective pairs in several locations. Problems are not necessarily centered on the interexchange carrier; they are just as likely to occur with the local exchange carrier, which adds to the confusion.

Affordable analog circuit test equipment is now available from several vendors ("Network test equipment puts the finger on faulty lines," *NW*, Feb. 16) but carriers vary in their willingness

See **Analog** page 34

NEC America's 18GHz Digital Microwave Radio is miles ahead of our competition in every way but one — its price.

For example, our systems link your local access network over greater distances than 23GHz radios. By using the economical and uncongested 18GHz narrow band, NEC America's advanced transmission capabilities provide better performance with twice the availability of 23GHz microwave systems.

With our 18GHz radios, a change in the weather won't change what you send. Unlike transmissions over the 23GHz band, your voice, data, and video signals remain unaffected by slight rain or fog.

C&C
Computers and Communications

And if you compare our radios with other 18GHz transmission systems, you'll find that NEC still takes the lead when it comes to performance, quality, and reliability.

Our Standard Features Leave the Competition Behind

Our digital radios have four independent T-1 lines (96 channels) built right in — there's no need for any external multiplexing equipment. Two analog service channels easily provide for your alarm, supervisory, or order wire requirements.

And we offer several different configurations to choose from, the most compact weighing under 40 pounds with a two-foot parabolic antenna.

Best of all, you get all these standard features at a price that puts the other manufacturers where they belong — in second place. So, don't hold back — get the leader of the pack.

Call Radio Marketing at (703) 698-5540, or write: Radio Marketing, NEC America, Inc., Radio & Transmission Marketing Sales Division, 2740 Prosperity Avenue, Fairfax, VA 22031.

NEC
NEC America, Inc.

Analog from **page 33**

to accept user-generated circuit test results.

However, once your carriers and suppliers know you are testing your own facilities, the burden of proof is shifted to them, and you will be able to resolve problems more quickly.

Getting the most for the money

Here are some tips that can help you optimize your private-line service:

- Use multiple carriers. To get the lowest possible rate on any specific combination of circuits, you'll probably have to utilize more than one vendor. It means more bills to track, but in many cases, the savings justify the inconvenience.
- Re-evaluate carrier service at least once a year. Review the number of trouble calls for specific channels. If there are significantly more for a specific carrier than others, perhaps it's time to replace the carrier.

How long does it take to get a circuit fixed? What other problems occurred as a result of delays in getting a circuit fixed? You may pay more for dependable service, but it's a better buy than discounted service that doesn't work.

- If a carrier provides a single point-of-contact option for handling service calls, take advantage of it. This could save many hours of frustration and finger pointing over who is responsible for fixing a circuit.
- If you can't resolve problems through normal channels, write to the president or chief executive officer of your carrier. If problems still persist, write to state and federal regulatory commissions — or consider switching vendors.

The market perspective

AT&T maintains its overall 80% to 85% market share of the private-line business, despite competition from MCI, US Sprint and a growing number of smaller specialized carriers.

Other carriers' promotional programs, such as the 30-day free trial use of circuits currently offered by ITT United States Transmission Systems, have so far not had a sizable impact on AT&T's solid position.

Two recent departures from the analog private-line business are RCA American Communications, which is now providing only high-speed digital circuits, and Argo Communications Corp., which recently filed for bankruptcy.

SDNs constitute a major future challenge to traditional private-line service.

SDNs utilize shared circuits and switches to provide temporary dedicated circuits on demand, supposedly eliminating the need for private lines and enabling users to reconfigure their networks quickly and easily.

But current SDN services tend to be high-priced, and to date, carriers offering SDN-like services have had limited success in convincing users to give up their private lines ("All's calm on the VPN front," *NW*, Jan. 26).

Users with many private lines in high-density routes will probably replace them with digital T-1 lines, but analog private lines will remain a cost-effective alternative for low-to-medium volume voice, data and telemetry applications for at least the next decade.

NETBIOS from **page 1**

ports the IBM communications interface, and fellow minicomputer maker Hewlett-Packard Co. announced it too is developing NETBIOS compatibility. Digital Equipment Corp. is also rumored to be working toward that end.

To date, Tandem leads the race to incorporate the de facto network standard. "NETBIOS support allows distributed applications to be written in which part of the program resides on a PC and communicates to the other part on the Tandem system," said Jeri Edwards, manager of information management technology for Tandem.

NETBIOS, which is independent of a computer's operating system, standardizes the interface between application programs and network capabilities. When introduced with the IBM PC Network, most personal computer network vendors presumed that NETBIOS would attract the largest number of application developers. Programmers writing to NETBIOS can use the same interface to communicate with minicomputer-based applications and local network-based personal computer applications.

NETBIOS defines seven network functions or calls that an application can request. These include naming services, datagram services and session services. Minicomputers that integrate NETBIOS can create sessions, broadcast, and send datagrams to NETBIOS-compatible micros.

But despite the promise, actual support of NETBIOS among application developers has been slow. "There weren't many application developers writing to NETBIOS in 1986," said Hewlett-Packard's Jackye Churchill, marketing manager in the Colorado Networks Division. Most MS-DOS developers wrote to DOS 3.1 to provide their applications with networking capabilities because DOS 3.1 is easier and more familiar. Churchill believes that will change in 1987.

Some analysts suggested, however, that minicomputer makers may be smarter to sidestep NETBIOS in favor of the application interface IBM provides in LU 6.2.

"The direction IBM is headed is LU 6.2," said Eric Killorin, president of Hyatt Research Corp. in Andover, Mass. "NETBIOS is not the appropriate protocol for companies like DEC to support. DEC's customers are used to peer-to-peer networks, and NETBIOS doesn't buy them anything."

Skepticism aside, "Some interesting third-party communications products that write directly to NETBIOS are beginning to emerge," said Dave Melin, product manager at Microsoft Corp.

For now, however, "If you want to exploit the capabilities of the minicomputer, NETBIOS requires writing a special program," Melin said. Until a variety of such programs becomes available, minicomputer vendor support of NETBIOS is "not that big a deal.

"It's more a statement of compatibility direction," he said. "The big LAN standard shakeout is coming down to supporting NETBIOS, DOS 3.1 extensions and the [Server Message Block] protocols. If you've got those three things, then people feel very comfortable that you'll be compatible with other software and third-party products."

Tandem took an early lead in developing NETBIOS support because it saw that it was useful in transaction-processing environments, Edwards said.

With NETBIOS compatibility, Tandem is seeing more use of personal computers for on-line transaction-processing applications. "We also see a lot of programs being created that split the application between the PC and the Tandem system."

NTI from **page 2**

tomer can do the same thing from his own terminal." Gustafson said the switches also provide central office local network capabilities. "With the digital switch, a customer can talk PC-to-PC or PC-to-host through an existing wire connection from the terminal to the central office," he explained.

In a few years, New York Telephone will use the switches to move towards ISDN, Gustafson said. "Right now, we're still cleaning out the smoke to determine what services can be offered over ISDN," he said. In the early stages, Gustafson said, Integrated Services Digital Network will be a money saver more for the network provider than the end user.

Northern Telecom's chairman and chief executive officer, Edmund B. Fitzgerald, said the contracts illustrate an increase in BOC business that will boost this fiscal year's revenue over last year's figures. In an address to the New York Society of Securities Analysts, Fitzgerald said he expects all product lines will contribute to the revenue increase and that earnings growth may even outpace revenue growth as a result of improved profit margins. Fitzgerald said he wants to restore the company to a 15% annual growth rate, a goal it failed to meet in fiscal 1986.

Commenting on the recent announcements, Doane Perry, a senior analyst with International Data Corp. in Framingham, Mass., said, "This illustrates how well-positioned Northern is to take advantage of the domestic market. The RBHCs don't want to rely on AT&T as they compete against it, and Northern has proven to be AT&T's biggest competitor in the central office."

Northern Telecom claims to have in excess of 1,100 DMS systems and 6,000 TOPS systems in operation worldwide.

Pillage from **page 27**

ments a particular protocol stack can interoperate only with an end node that implements the same protocol stack — and only across a network that uses the lower layers of that protocol stack.

The point is that there are literally thousands of ways to combine existing and future protocols, standard and proprietary, into various protocol stacks, and if we're not careful, we'll end up implementing every one of them. That possibility is exactly what OSI was designed to avoid.

Interoperability won't happen just because users want it to, because vendors say it will or because the International Standards Organization and the Consultative Committee on International Telephony and Telegrapy say it can. It will happen only when all members of the data communications community work together to make it happen.

Building universal interoperability is a painful process. Ask anyone who has implemented a full gateway.

On the technical side, it involves developing custom software and specifying standards above the application layer. On the administrative side, achieving universal interoperability means long-term planning, cooperation between separate departments, offices and administrations, changes in procurement policy, long-term clauses in contracts and the monitoring of vendor and product trends. And it will take a long time. There's no room for shortsightedness or quick fixes. Universal interoperability must become a strategic goal affecting the procurement of every piece of data communications and data processing equipment and software.

Vendors must also be considered in long-term planning for interoperability, but users must guide vendors. More OSI users groups, such as the MAP/TOP Users Group, must be formed for each industry or community of interest. These groups must figure out what they want and how vendors can do it, and then demand it from vendors.

OSI is here. Let's do something with it, and let's do it right.

> The point is that there are literally thousands of ways to combine existing and future protocols, standard and proprietary, into various protocol stacks.

▶ 911 TELEPHONE SYSTEM

Better safe than sorry

Memphis area consolidates its emergency system.

BY REX HOLLAWAY
Special to Network World

In 1984, a new Tennessee state law empowered each county government to create a 911 emergency telephone system district as a separate political entity, and to collect fees from each telephone subscriber to fund the operation of the system.

Over the past two years, a complex 911 telephone system was implemented in Shelby County, which contains Memphis and several smaller municipalities, as well as a large unincorporated area under the jurisdiction of a county sheriff.

Because there was no central communications center to handle all emergency service requests within the county, a tremendous effort was needed to define the addresses where one jurisdiction began and another one ended for all streets and roads. This was in addition to the normal verification of street names and address ranges required with any 911 installation.

Early in the project, the 911 district board realized there were four principal obstacles that had to be overcome. First, with the possibility of 10 different 911 systems within the county, there was concern that additional manpower requirements at each public safety answering point (PSAP) would be an unwise use of public funds.

Second, because there are two telephone companies within the county, problems would certainly crop up if both had to be dealt with independently.

Third, the current tariffs restricted the liability of the telephone companies to a maximum of $50, even if a telephone company employee intentionally caused damage or disruption to the system. This was an example of how tariffs protected the telephone companies rather than consumers.

Fourth, only one type of 911 equipment was available and offered by the telephone company, and it was introduced more than 15 years ago.

Because of these obstacles, installation of the 911 system was delayed by at least 12 months, but the delay did have a bright side. Because of the recent popularity of so-called enhanced 911 systems that display the location of the caller, additional manufacturers have surfaced. Now users have several equipment alternatives.

Because of obstacles, installation of the 911 system was delayed by at least 12 months, but the delay did have a bright side.

See **Safe** page 36

Hollaway is a senior consultant at Mitchell & Horrell, Inc., a telecommunications consulting firm in Memphis, Tenn.

Safe from **page 35**

After considerable discussion, it was decided that each of the seven smaller municipalities would have its own PSAP to handle all 911 calls within its jurisdiction. With one exception, each of these PSAPs has one dispatch point for fire, police and ambulance calls. One municipality handles only fire and ambulance calls, with the county sheriff being responsible for law enforcement. As it turned out, these smaller municipalities didn't ask for additional support staff.

For Memphis and the unincorporated areas of the county, the problem was solved by creating a single answering point that would screen the 911 call and determine the specific need. Then the call would be transferred to the appropriate city or county agency. This was necessary because the city had separate police and fire communications centers located in different parts of the city. The county operated in exactly the same way. Only this single answering point for Memphis and the county would require extra manpower.

The primary provider of telephone service in Shelby County is South Central Telephone Co., a subsidiary of BellSouth Corp. South Central Telephone and the 911 district board agreed that overall project management by one vendor was crucial and finally made arrangements with the other service provider — an independent telephone company — so that the Bell operating company provided and maintained all 911 equipment including the PSAP controller and terminals at the two PSAPs within the independent telephone company's territory.

Tariff issues have probably caused the most delay and certainly the most frustration for the entire project. Countless meetings with lawyers, South Central Telephone representatives and the Public Service Commission were required to resolve the various liability issues to the 911 district's satisfaction.

> South Central Telephone and the 911 district board agreed that overall project management by one vendor was crucial.

Now that the major obstacles were overcome, there was still the job of connecting the various telephone systems to the 911 equipment. South Central Telephone knew at least two years ago that it must be able to connect with the largest PSAP's Northern Telecom, Inc. SL-1 private branch exchange. Working with AT&T Technologies and Northern Telecom, a "black box" was developed that would allow information about the call origin and dispatcher position (in the automatic call distributor) to be passed on to the PSAP controller equipment.

However, there still were various smaller electronic key systems that could not pass the needed information to the PSAP controller. Even the Dimension PBX supplied by AT&T to the Memphis Fire Department would not connect to the controller. AT&T was unwilling to create an interface for the Dimension system, much less the non-AT&T key systems.

> Tariff issues have probably caused the most delay and certainly the most frustration for the entire project.

With no solution for interfaces in sight for these smaller systems, alternatives were worked out with each PSAP. Standard key equipment would be required and would be placed alongside the existing more modern telephone sets. It should be noted, though, that most of the PSAPs preferred the arrangement to eliminate finger pointing by the two vendors responsible for service.

Just when it looked like the time was right to proceed completely with the BOC-offered 911 equipment, Positron Industries, Inc., of Montreal, announced it was now ready with its 911 system. Because of pressure to move on with the project, South Central Telephone was given the go-ahead on the preparation of the data base, since equipment type was not important to this stage of the work.

The BOC has indicated that it is willing to provide the new Positron system if it meets the needs of the district and is proven reliable enough to provide a good level of service. Representatives of the 911 District and South Central Telephone went to Los Angeles recently to see a live system installed in the Los Angeles Police Department dispatch center and said they were impressed with it.

It's important not to confuse convenience and expediency with response to the emergency. Unless a city increases its field resources, response time may only be increased by lessening the time it takes to reach the 911 operator. The good news involves the possibility of prosecuting those who make bogus calls because recorded data will identify the location of the call. This could reduce the wasted time spent responding to false alarms.

Hospital from **page 1**

old AT&T Dimension switch in place. It had no growth capabilities, few calling features and was very expensive," he stated.

Shams outlined the hospital's voice, data and image communications requirements in a formal request for proposal, to which numerous local vendors and distributors responded. He used a four-part criteria to judge the RFP responses that he dubbed, "the four Fs: flexibility, functionality, financing and future growth."

In financing, Shams sought the most for the money. "I wanted installation included in the package, maintenance for at least five years and an option to bring support in-house," he said. Looking at a vendor's research and development indicated to Shams "how the products had matured over time and gave me an indication of their future directions."

Of the respondents, Shams found that "PACTEL offered a lot of voice communications features and support no one else could provide." He had also read that PACTEL was considering distributing DG products, and that it was also distributing Northern Telecom products. Shams then called PACTEL and broached the concept of one-stop shopping for both voice and digital communications services and equipment.

"I'm first a business manager and then a technician," he stated. "I don't buy a product, I buy values from a company. I buy their beliefs. When you approach a company with this attitude, you have an exchange, not a purchase. It gets the company to commit to your goals," Shams explained.

The benefits of one-stop shopping can be seen in the following:

- PACTEL installed new voice and data wiring for the hospital's three buildings for free. Shams estimates savings of close to $1,000 per station, or $256,000 on the six pairs of twisted-pair telephone wire for each of the hospital's 256 workstations. Plans to add another 250 workstations will result in equally substantial savings.
- A 20% discount on all equipment purchased in the first year has netted the hospital a $230,000 savings in equipment costs alone.
- The CoitCom microwave network that PACTEL bundled into the communications package will save the hospital $137,000 in telecommunications costs over four years.

"We attempted to prove it doesn't take a lot of money to do things right. The key is planning and understanding the emerging and converging technologies," he noted.

One of the key applications the integrated net supports is providing physicians with dial-up access to an on-line data base containing patient care information. Local physicians use the data base for a variety of tasks, including billing and patient visit information, reducing calls to the hospital's billing and admitting departments.

The system has spurred wider use of hospital facilities, Shams said, and has made it a leader in such areas as obstetrics, elderly care and segments of critical care.

The hospital has leveraged the patient data base itself to create services such as insurance counseling for senior citizens, and pre- and postnatal care programs for its obstetrics patients.

In addition to patients' pertinent information, such as name, age, address and insurance information, the hospital records their admitting diagnosis, working diagnosis while staying at the hospital and the drugs administered.

Shams claims the system has virtually eradicated paper pileup and human form-processing error, and has eliminated the need for typewriters and filing cabinets in the hospital. According to Shams, the admittance procedures now take less than four minutes per patient.

To Shams, making life easier for the hospital's patients is important. For example, he backed the installation of laser printers to enlarge the typeface on bills so senior citizens can read them better.

Standards from **page 4**

Titled "Status — Standardizing Management of OSI Networks," the panel discussion appraised the current state of OSI network management standards, discussed the agenda for progress and examined how MAP efforts fit into the larger standardization movement.

COS and other standards groups are strengthening their emphasis on net management standards. A network management subcommittee was created there in October 1986 to collect available research on the technology. Committee member Scott Helmers, senior product manager for network management at Wang Laboratories, Inc., said the group is planning a tutorial for the COS's governing body, the Strategy Forum, and said the educational module could eventually be presented publicly. "Our intent is to allow this to be presented to a more open audience," Helmers said.

At the most recent meeting of the COS subcommittee, Will Collins, consulting engineer at Codex Corp. and chairman of the ANSI's X3T5.4 committee for network management, said ISO standards for OSI net management should be at the draft international standard stage in 1989 or 1990. Standards that reach this status are normally considered requisite for vendors' conformance efforts and for COS conformance testing.

Most users and vendors say the results are crucial to efficiently managed networks and likely to play an important part someday in user organizations. "Our work [at standards organizations] is driven by a user requirement that says we need nonproprietary, remote management capabilities in a multivendor network," said Atul Kapoor, chairman of the MAP/TOP Network Management Subcommittee and a project engineer at General Motors Corp.

CAREER ANNOUNCEMENTS

Are you looking for...

Data Communications Managers?
Telecommunications Managers?
Telecommunications Engineers?
Network Managers?
Communications Networks Specialists?
Factory Communications Managers?
Systems Analysts?
Telecommunications Analysts?
Transmission Managers?
Data Communications Consultants?
Systems Engineering Managers?
Directors of Information Services?
Project Engineers/Network Development?
Telecommunications Software Programmers?
Systems Network Programmers?
Senior Datacommunications Specialists?
Telecommunications Network Planners?
Manager Voice Communications?
Senior Satellite Systems Engineers?
Project Leaders?
Group Datacommunications Sales Managers?

No matter who you want to recruit, *Network World* delivers your message to the right audience of communications professionals.

For details, call Classified Advertising Dept., toll free at
800-343-6474 (617-879-0700 in MA)

NETWORK WORLD

A number of Special Sections, Product Focuses and Service Focuses are scheduled to run in **NETWORK WORLD** during 1987. Each of these features will focus on one aspect of the computer industry and give our advertisers a chance to reach a more select audience. These are some of the topics the features will cover:

Special Section

- March 16 - Wiring & Cable
- April 6 - DEC Special
- June 8 - Comm. Mgr. Salary Survey
- June 29 - ISDN
- July 20 - Centrex
- August 3 - Hybrid Networks

Product Focus

- March 9 - Local Area Networks
- March 30 - Digital PBX's (Med-High)
- April 20 - Microwave Transmission
- May 11 - Micro-to-Host Links
- June 1 - High Speed Modems
- July 6 - Mid Range Mux's
- July 27 - Voice Messaging

Service Focus

- March 2 - Long Haul Carrier Private Line Services
- March 23 - Electronic Mail Services
- April 13 - Bulk Calling Services
- May 4 - BOC Services
- June 22 - Value Added Network Services (VAN's)
- July 13 - VSAT Services
- August 10 - DDS (Digital Data Services)

NETWORK WORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. The March 16th issue will be closing March 6th. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone.

Our mailing address is

NETWORK WORLD
Classified Advertising, Box 9171,
375 Cochituate Road, Framingham, MA 01701-9171
Or call for more information at: **1-800-343-6474**
or, in Massachusetts, **(617) 879-0700**

CLASSIFIED ADVERTISING

Information Form

Name____________________

Title____________________

Company____________________

Address____________________

Telephone No.____________________

☐ Please send me more information on Classified Advertising.

☐ Please have someone call me with information.

Return to:

NETWORK WORLD
Classified Advertising
375 Cochituate Road
Framingham, MA 01701

Interface Show Issue

Special Interface Show Issue

Special Recruitment Advertising Offer

Call for further information on the advertising savings available to you for this Special Issue.

The Interface Show Issue - March 30th

Closes: March 20th

Bonus Show & Hotel Distribution

NETWORK WORLD
Classified Advertising
375 Cochituate Road, P.O. Box 9171,
Framingham, MA 01701-9171
1-800-343-6474 (In MA) **617-879-0700**

AT&T from **page 2**

ternational Data Corp., concurred. “For two years now, AT&T has bought interest in a number of companies. I think they are looking primarily in the data communications area and are now planning to acquire outright as part of their data networking strategy,” he said.

Spencer Rice, president of S.R. Consultants, a Madison, N.J.-based consulting firm, said AT&T desperately needs to purchase some companies with established market shares in order to succeed in merging computers and communications.

“The company has formed a lot of joint ventures, but that’s not enough,” Rice noted. “They have talked about acquisitions for over a decade. I think they may finally be putting their money where their mouth is.” Rice said he envisions AT&T as an end-to-end supplier of computer and communications equipment.

AT&T said money raised by issuance of the new shares might be used to fund “business opportunities,” but said it currently has no plans for such a stock offering. Nichols surmised that any acquisitions will be held off until 1988, when the company recovers from cost-cutting measures put into effect this year.

Those cost-cutting efforts were at the heart of Moody’s decision to lower its bond rating of AT&T. The investor service praised the restructuring program, but said it would not positively affect AT&T’s balance sheet before the end of the decade.

Moody’s said, “Weak market conditions and intense competition will continue to adversely affect most of AT&T’s nonregulated businesses. Regulated activity is highly profitable,” but limited by rate of return regulations. Moody’s said it is possible that AT&T will be forced into taking another write-down.

Commenting on Moody’s action, Pafumi said, “AT&T’s stock is doing poorly. Essentially, they are going to continue to lose money in nonregulated business, and earnings on the regulated side are coming down. In light of all that, it’s Moody’s opinion that AT&T is not a great credit risk.”

Rice said the action was a response to AT&T’s own prediction that it will take a year or more to return to profitability.

He challenged Moody’s pessimism, saying “AT&T is still a long-term safe investment. Our research shows that its market share has bottomed out and is now on the rise again.”

New DOS from **page 4**

communications would, for example, handle communications between portions of distributed applications. “The ability of applications to get other applications to do work for them across the network will be dramatically enhanced,” said Steve Ballmer, vice-president of system software for Microsoft.

Today, network applications communicate via IBM’s Network Basic I/O System, but New DOS will use program-to-program communications, Ballmer said. Ballmer did not elaborate on how existing applications using NETBIOS would be supported, or whether Microsoft’s program-to-program communications would be compatible with IBM’s efforts in this area.

One key difference between MS-DOS and New DOS is that MS-DOS runs in the Intel microprocessors’ real mode, while New DOS supports both the real mode and the protected mode available in these microprocessors. Real mode allows applications to address any hardware device in a personal computer, including the processor and memory. This makes multitasking impossible because applications could overwrite one another.

The protected mode prohibits this direct control of hardware by giving control of critical functions, such as memory management, to the operating system. Although the 80286 and 80386 microprocessors have both real and protected modes, applications written for one mode will not run in the other mode. Current applications that make many calls to the personal computer hardware would have to be rewritten to run in the protected mode, Ballmer said.

Microsoft will also be enhancing MS-Networks, which currently handles network functions such as managing the connection to the network, exchanging data among personal computers and network security. Certain areas are targeted for improvement, including performance. And ease-of-use and other features will be added, according to Mark Mackaman, MS-DOS product manager.

These new features likely will include better password security, improved system administration capabilities and the ability to view documents spooled to a printer, Mackaman said.

Microsoft promised that, within the next six months, independent software vendors will receive tool kits for building applications based on New DOS.

Network World Sales Offices

BOSTON
Donna Pomponi
375 Cochituate Rd.
Box 9171
Framingham, MA 01701-9171
(617) 879-0700

WASHINGTON, D.C.
Bill Burke
2133 Defense Highway
Suite 205
Crofton, MD 21114
(301) 721-4763

ATLANTA
Tom Tolbert
1400 Lake Hearn Dr.
Suite 330
Atlanta, GA 30319
(404) 394-7509

LOS ANGELES
Ferris Ferdon
18004 Sky Park Cir.
Suite 100
Irvine, CA 92714
(714) 250-3006

NEW YORK/PHILADELPHIA
Joan Daly
Paramus Plaza 1
140 Route, 17 North
Paramus, NJ 07652
(201) 967-1350

SAN FRANCISCO
Chris Clyne
3350 West Bayshore Rd.
Suite 201
Palo Alto, CA 94303
(415) 328-4618

CHICAGO
Fran Jonikaitis
2600 South River Rd.
Suite 304
Des Plaines, IL 60018
(312) 827-4433

CLASSIFIED ADVERTISING
375 Cochituate Rd.
Box 9171
Framingham, MA 01701-9171
(617) 879-0700

Network World Headquarters

375 Cochituate Road, P.O. Box 9171
Framingham, MA 01701-9171
Phone: (617) 879-0700, Telex: 95-1153, FAX: (617) 875-8931

Ron Mastro
National Sales Director

Pam Valentinas
Manager/Marketing & Sales Operations

Karen Wallace
Account Coordinator

PRODUCTION **Production Director,** Peter Holm, **Senior Production Manager,** Leigh Swearingen, **Production Assistant,** Christopher P. Cuoco
CIRCULATION **Corporate Distribution Manager,** Robert W. Wescott, **Circulation Manager,** Richard Priante

Computerworld is a member of the CW Communications/Inc. group, the world’s largest publisher of computer-related information. The group publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more of the group’s publications each month. Members of the CWCI group contribute to the CW International News Service offering the latest on domestic and international computer news. Members of the group include: ARGENTINA’S *Computerworld/Argentina, PC Mundo;* ASIA’S *Asian Computerworld Hong Kong, Computerworld SE Asia;* AUSTRALIA’S *Computerworld Australia, Communications World, Australian PC World, Australian Macworld;* AUSTRIA’S *Computerwelt Oesterreich;* BRAZIL’S *DataNews, PC Mundo, Micro Mundo;* CHILE’S *Informatica, Computacion Personal;* DENMARK’S *Computerworld Danmark, PC World Danmark;* FINLAND’S *Tietoviikko, Mikro;* FRANCE’S *Le Monde Informatique, Distributique, InfoPC, LM Telecom;* GREECE’S *Micro* and *Computer Age;* HUNGARY’S *Computerworld/SZT, Mikrovilag, Tudomany;* INDIA’S *Dataquest;* ISRAEL’S *People & Computers Weekly, People & Computers Monthly;* ITALY’S *Computerworld Italia;* JAPAN’S *Computerworld Japan;* MEXICO’S *Computerworld Mexico;* THE NETHERLAND’S *Computerworld Netherlands, PC World Netherlands;* NEW ZEALAND’S *Computerworld New Zealand;* NORWAY’S *Computerworld Norge, PC World Norge;* PEOPLE’S REPUBLIC OF CHINA’S *China Computerworld, China Computerworld Monthly;* SAUDI ARABIA’S *Arabian Computer News;* SOUTH KOREA’S *Computerworld Korea, PC World Korea;* SPAIN’S *Computerworld Espana, Commodore World, PC World Espana, Communicationes, Informatica Industria;* SWEDEN’S *ComputerSweden, Mikrodatorn, PC World;* SWITZERLAND’S *Computerworld Schweiz;* UNITED KINGDOM’S *Computer News, DEC Today, ICL Today, PC Business World, Lotus UK;* UNITED STATES’ *Amiga World, Boston Computer News, CD-Rom Review, Computerworld, Computers in Science, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, inCider, InfoWorld, MacWorld, Micro Marketworld, Network World, PC World, Portable Computer Review, Publish!, PC Resource, RUN;* VENEZUELA’S *Computerworld Venezuela;* WEST GERMANY’S *Computerwoche, PC Welt, Run, Information Management, PC Woche.*

CALENDAR

March 3-5, Washington, D.C. — Telecommunications for Distributed Processing Systems. Contact: Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052.

March 4, Boston — Alternatives for Voice Messaging. Contact: Women in Telecommunications, P.O. Box 1344, Cambridge, Mass. 02238.

March 9-11, Chicago — Local Communications Systems: Wiring, Private Branch Exchanges, Local Area Networks and Much More. Also, April 6-8, San Francisco; May 11-13, New York; June 15-17, Dallas. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

March 11-12, New York — Understanding Integrated Services Digital Network. Also, March 23-24, Chicago. Contact: Telecommunications Research Associates, P.O. Box 1200, Newark, Ill. 60541.

March 11-13, New York — Network Management, Control and Problem Determination. Contact: *Business Communications Review*, 950 York Road, Hinsdale, Ill. 60521.

March 12-13, San Francisco — Packet Switching Protocols. Also, March 26-27, Chicago. Contact: X.Concepts Limited, P.O. Box 6116, St. Charles, Mo. 63302.

March 12-13, New York — Local Area Networks: Selection and Implementation. Contact: Digital Consulting Associates, Inc., 6 Windsor St., Andover, Mass. 01810.

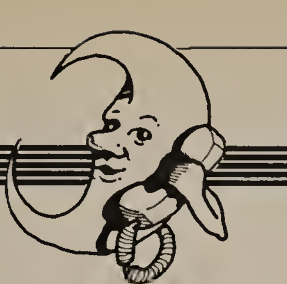
March 12-13, Denver — Data Communications and Networking for the IBM PC, XT, AT and Compatibles. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

March 12-13, New York — Networking Personal Computers. Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

March 16-17, Atlanta — Local Area Networks, Including IBM’s New Token-Ring Network. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

March 16-19, Boston — The First International Military Fiber Optic and Communications Exposition. Contact: Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

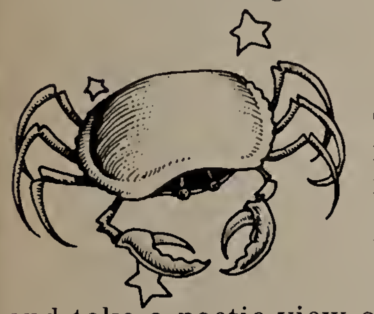
March 18-19, New Orleans — Educational Seminar on T-1 Facilities and Networking. Contact: Timeplex, Inc., 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.



HORRELLSCOPES

BY EDWARD HORRELL

In communications today, it takes more than just good business sense to survive; it requires celestial guidance.



Cancer: Under the influence of the moon, Cancers are real homebodies. You, loyal Cancer, are highly sensitive and take a poetic view of the world. Yours is a romantic light, and vulgarity you find distasteful.

So, it must be users under the other signs who are calling all the naughty pornographic services. One of the most frequent complaints from telecommunications managers these days concerns the problem of tracking callers of pornographic services. Many managers have told Horrellscopes that literally thousands of dollars worth of calls are being made to these nasty numbers at company expense.

Telecommunications managers have got to do more than rely on cardinal virtue to keep the romantic needs of users off the company accounts. Specifically, the following suggestions might help alleviate unauthorized calls to these X-rated services:

- Implement a personal call-accounting program, and let users have a method for "volunteering" to pay for personal calls. One mid-Atlantic bank has generated more than $150,000 per year in revenue from employees who pay for their personal calls.
- Pay attention to your call-detail reports. When strange numbers begin to accrue in large quantities, check them out (but not too closely, fellas). And if you find any of those dirty numbers, check the software in your private branch exchange to determine if it can screen calls to the guilty area code and exchange.
- Don't blame Cancers; they're too romantic to be interested in sleaze.
- Finally, even if all else fails, never consider competing by adding your own in-house dirty number. Although the earnings might be tremendous — some operations rake in more than $10,000 per week, which they share with their community-minded local operating company — productivity will certainly plunge as users' minds travel to the stars.

Virgo: Users under Mercury's influence are quick moving and love change and variety — but they're sticklers for method and order. They feel that nothing can be accomplished without a meticulous, systematic progression. For you, dear Virgo, the cellular telephone was invented.

And once you have one, you'll wonder how you got along without it. But the predictions are cloudy as to the ultimate success of cellular telephone service.

It is estimated that less than 3% of the potential cellular phone market has already been tapped. This could mean that overall interest in portable telecommunications is not high. But, on the contrary, users of cellular service want more, and they want it quickly. To this extent, companies such as AT&T, Northern Telecom, Inc. and Mitel Corp. are experimenting with wireless PBXs. The charts indicate that total portability will be a feature of the next generation of telephone systems.

The wireless PBX will interface conventional PBXs through buildingwide low-frequency cells, similar to the powerful cells used in cities for cellular telephone systems. Experts predict this will eliminate the need for wiring within a building.

Sound like Dick Tracy? You bet. But be forewarned, practical Virgo, you'll love it.

Libra: The sky is no longer falling on long-distance pricing, and a balance between price and quality will soon control this market.

But before the sign of equilibrium can rule, the planets reveal one more drop in basic long-distance service prices, somewhere around 5%. This will occur within nine months.

Following that, the emphasis by the major long-distance companies will be on quality and new types of services.

These new services include INWATS service by MCI Communications Corp. and US Sprint Communications Co., as well as combined INWATS and OUTWATS services on one line. Users will make long-distance decisions based less on price than ever before.

Scorpio: There is no such word as "can't" in Scorpio's bright lexicon. Scorpio's belief is that anything and everything can be done if the mind and heart are determined.

Thus, it is evident that the Scorpios in the Justice Department have prevailed in asking U.S. District Court Judge Harold Greene to lift the restrictions on the regional Bell holding companies.

Justice said that the regional companies should be allowed to make telephone equipment, provide electronic yellow pages, enter nontelecommunications businesses and provide virtually any type of service they decide to pursue. These ventures are potentially worth billions of dollars to the RBHCs.

The Justice Department's rationalization? The plethora of information services has not been enjoyed by American consumers because of restrictions on the RBHCs. And while AT&T and others are claiming this is the sting that will lead to chaos in many markets, the influence of Scorpio will dominate. Freedom has indeed come for the RBHCs.

The charts are clear. The Baby Bells are about to be unleashed, and new services are going to explode into a galaxy of new offerings.

Cosmic catastrophe of the month

AT&T has announced price reductions of up to 30% on its personal computer line.

Great balls of fire! These price cuts signal a similar disaster to the one AT&T experienced by entering the personal computer market. With layoffs, distribution problems, high prices and a new emphasis on networking, the lagging computer sales of AT&T appear to be taking their toll on the company.

Where is the once ballyhooed clash of the AT&T and IBM data processing titans? Where is the impact of Unix? Where are the results of the unleashing of AT&T's technology in the microcomputer marketplace?

We'll watch the charts for these answers, stargazers, but the outlook for AT&T as a computer vendor looks awfully dim.

Sagittarius: The nature of Sagittarius is to be careful about money matters. Governed by the planet of Jupiter, the ninth sign of the zodiac is careful about knowing the value of money.

Thus, a warning to users: Beware of telephone systems in hotels and motels, which are under the influence of the Sagittarian constellation. Laissez-faire is the rule of regulation here, and the long-distance charges by hotels are not regulated. The recklessness of this sign means costs may be marked up as much as users will bear.

And this means that unwary travelers may pay upward of 200% of the actual cost of a long-distance call. How can a traveler beat the system? By following these tips:

- Upon registering, find out if the hotel adds a surcharge for credit card calls. If not — and most don't — use a long-distance credit card exclusively for calls from your hotel room.
- For lengthy calls to home or office, call your party and have them call you back immediately. The potential savings can be enormous.

One further tip: Don't expect the room clerk or night manager to know anything about percentage markups or how calls are priced at the hotel. They're traditionally the most uninformed of the lot.

Aquarius: Activity and industry characterize the nature of the sign of healing. Aquarians can bring joy where misery reigns. They breed the necessary qualities for success and are capable of bringing consolation to the weary and alleviating illness and fatigue.

An Aquarian white knight may be needed to help MCI, the current sufferer in the long-haul competition.

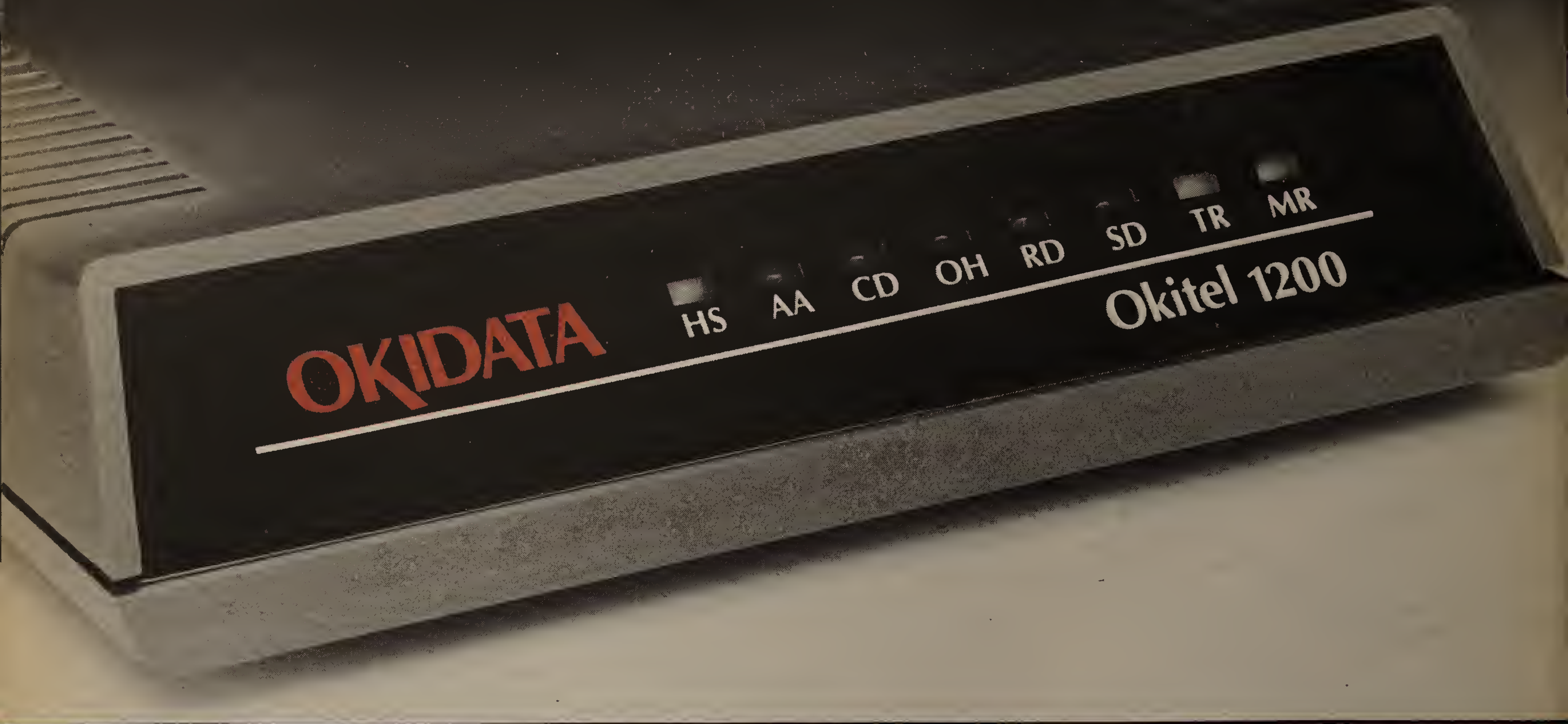
MCI is sick from losing money — more than $500 million in the last quarter. The carrier's woes can be attributed to competitive cost cutting in an effort to keep pace with AT&T and the aggressive rebirth of US Sprint.

MCI is caught in an uncomfortable position now. It's too big to cut costs further and too conservative to counterpunch US Sprint's competitive aggression.

Stargazers should watch for an Aquarian solution for MCI. Will it be cash from IBM? Will it be the dumping of Satellite Business Services or will it be a white knight with saddle bags of money from a land unknown? One thing is clear: MCI needs help fast. ◼

Horrell is president of Mitchell & Horrell, Inc., a telecommunications consulting firm in Memphis, Tenn.

Funny. It doesn't look like a printer.



It's Not.
It's the New OKIDATA PC Modem.

If the name's familiar but you can't place the face, relax. The new OKITEL™ 1200 is every bit as good at "bits per second" as our printers are at "characters per second."

And that's very good.

You see, besides being a big name in personal printers, OKIDATA is a titan in telecommunications. Our parent company is one of the biggest telecommunication equipment suppliers in Japan.

Get It Right the First Time With Automatic Adaptive Equalization.

Because the OKITEL 1200 automatically adapts to widely varying line quality, your data rarely gets lost or disconnected by a "noisy" line. So you hardly ever have to re-transmit. A convenience usually found only in higher-speed modems.

Our new PC modem also offers auto-dialing, auto-answering, and auto-disconnecting. The ability to use tone or pulse-dialing. As well as a special self-diagnostic loopback.

On-Line, On-the-Double.

To help you get instantly acquainted with your OKITEL 1200, we're including a special introductory offer that provides up to $150 in discounts on three of the most popular on-line services: CompuServe®, Newsnet® and Dow Jones® News/Retrieval.

Turn Ordinary Minutes Into OKIDATA Minutes.

When you use a modem, every minute means money. But an OKIDATA Minute actually saves you money. You get a full 60 seconds of quality time every minute you're on-line because you get it right the first time.

The OKITEL 1200 PC Modem. Fewer transmission breaks, plus automatic error detection and automatic adaptive equalization.

Start getting your money's worth out of every modem minute. Get the new OKITEL 1200 modem with the very familiar—and very respected—name.

Call toll-free, 1-800-OKIDATA for the name of the OKIDATA dealer nearest you.

OKIDATA®
an OKI AMERICA company

Registered trademarks: OKIDATA, Oki America, Inc. Marque déposée de Oki America, Inc.; CompuServe, CompuServe Information Services; Dow Jones News/Retrieval, Dow Jones and Company, Inc.; Newsnet, Newsnet, Inc. Trademarks: OKITEL, Oki Electric Industry Company, Ltd.